SIEMENS

SOMATOM Volume Class

CT

DICOM Conformance Statement

Version A20A

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Manufacturer‘s note:

This product bears a CE marking in accordance with the provisions of directive 93/42/EEC of June 14th, 1993 for medical products.

The CE marking applies only to medico-technical products/medical products introduced in connection with the above-mentioned comprehensive EC directives.

The original version of this manual was written in the english language.

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Introduction

Overview

This DICOM Conformance Statement is written according to part PS 3.2 of [1].

The applications described in this conformance statement are implemented in the Siemens SOMATOM Volume Class products using software Somaris/5 VA20A.

The Somaris/5 DICOM network implementation acts as SCU and SCP for the DICOM Verification, Storage, and Query/ Retrieve Service Classes. It acts as SCU for the DICOM Print Management Service Class, the Basic Worklist Management Service, and Study Management Service Class.

These service are described in "Part I".

The Somaris/5 DICOM Media Storage Service Class implementation acts as FSC, FSU, and FSR for the specified application profiles and the related SOP Class instances. These services are described in "Part II".

Somaris/5 is based on a Siemens common medical platform. This platform is shared with other Siemens modalities in order to provide a common look and feel and common interoperability features.

In this document parts of the Siemens common medical platform are referenced by the terms "Syngo", "MedCom", and "CSA".

As Somaris/5 is a Syngo based product, this DICOM Conformance Statement is based on the corresponding Syngo template [2].

Audience

This document is intended for hospital staff, health system integrators, hospital IT-managers, and software designers or implementors. It is assumed that the reader has a working understanding of DICOM.

Scope

This DICOM Conformance Statement refers to Siemens SOMATOM Volume Class products using software Somaris/5. The following table relates software names to Siemens products.

Software Name	SIEMENS Product
Somaris/5 VA20A	SOMATOM Volume Class

Definitions, Acronyms and Abbreviations

Definitions

- **DICOM**: Digital Imaging and Communications in Medicine
- **DIMSE**: DICOM Message Service Element
- **DIMSE-C**: DICOM Message Service Element with Composite information objects

Acronyms and Abbreviations

- **ACR**: American College of Radiology
- **AE**: DICOM Application Entity
- **ASCII**: American Standard Code for Information Interchange
- **FSC**: File Set Creator
- **FSR**: File Set Reader
- **FSU**: File Set Updater
- **HIS**: Hospital Information System
- **IOD**: DICOM Information Object Definition
- **ISO**: International Standard Organization
- **NEMA**: National Electrical Manufacturers Association
- **O**: Optional Key Attribute
- **R**: Required Key Attribute
- **RIS**: Radiology Information System
- **RWA**: Real-World Activity
- **PDU**: DICOM Protocol Data Unit
- **SCU**: DICOM Service Class User (DICOM client)
- **SCP**: DICOM Service Class Provider (DICOM server)
- **SOP**: DICOM Service-Object Pair
- **U**: Unique Key Attribute
- **UID**: Unique Identifier
- **VR**: Value Representation

References

[1]: Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-3.14, 1998

[2]: MedCom VA42B DICOM Conformance Statement

Connectivity and Interoperability

The implementation of the Somaris/5 DICOM interface has been carefully tested to assure correspondence with this Conformance Statement. But the Conformance Statement and the DICOM standard do not guarantee interoperability of Siemens modalities and modalities of other vendors. The user must compare the relevant Conformance Statements and if a successful interconnection should be possible, the user is responsible to specify an appropriate test suite and to validate the interoperability, which is required. A network environment may need additional functions out of the scope of DICOM.

PART
A

DICOM Conformance Statement

Network

CHAPTER
A.1 Implementation Model

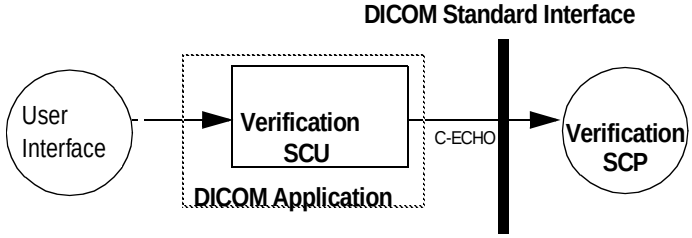
Verification

The Verification service class defines an application-level class of service which allows for the operator to verify the ability of an application on a remote node to respond to DICOM messages. The DICOM Service Tool application supports the Verification service to act as SCU.

The other direction – responding to Verification requests from remote applications – is handled by the Storage SCP application.

Application Data Flow Diagram

The Somaris/5 DICOM network implementation is a Windows NT application and acts as SCU for the Verification service.



Functional Definitions of Application Entities

The DICOM Service Tool application opens an association to an application on the remote node and sends a Verification message to verify that the remote application can respond to DICOM messages.

Sequencing of Real-World Activities

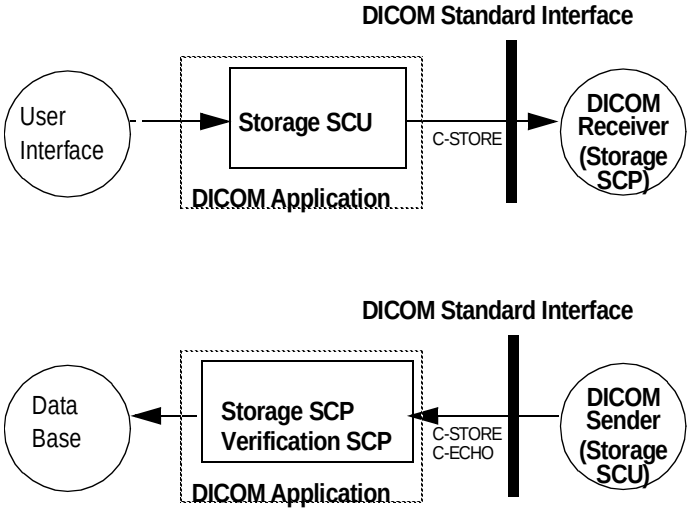
not applicable.

Storage

The Somaris/5 DICOM Application Entity originates associations for Storage of DICOM Composite Information Objects in Remote Application Entities.

Application Data Flow Diagram

The Somaris/5 DICOM network implementation is a Windows NT application and acts as SCU and SCP for the C-STORE DICOM network service and as SCP for the C-ECHO DICOM network service.



Functional Definitions of Application Entities

All SCP components of the Siemens Somaris/5 DICOM application are operating as background daemon processes. They are existing, when the machine is powered on and waiting for tasks.

Sequencing of Real-World Activities

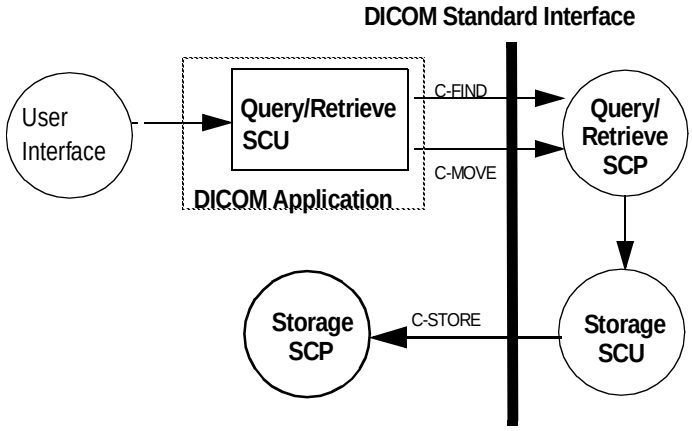
not applicable.

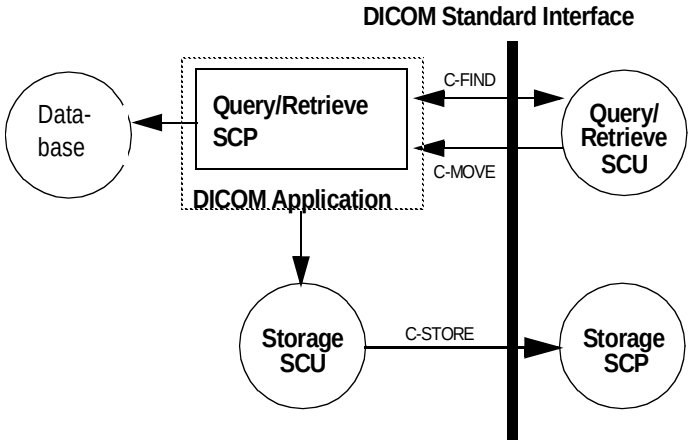
Query/Retrieve

The query/retrieve service class defines an application-level class of services which facilitates the management of images and patient data against the well defined information model of DICOM and allows a DICOM AE to retrieve images from a remote DICOM node or to request a remote DICOM AE to initiate a transfer of images to another DICOM AE. The DICOM query/retrieve application supports the query/retrieve services to act as SCU and SCP.

Application Data Flow Diagram

The Somaris/5 DICOM network implementation is a Windows NT application and acts as SCU and SCP for the query/retrieve network service.





Functional Definitions of Application Entities

The query/retrieve SCU requests the query/retrieve SCP to perform a match to the keys specified in the request and a C-MOVE DIMSE service initiates a C-STORE suboperation to transfer an image from a Storage SCU to a Storage SCP.

The query/retrieve SCP responds to C-FIND DIMSE services and a C-MOVE involves the Somaris/5 DICOM query/retrieve SCP application to initiate a C-STORE suboperation to a Storage SCP.

All components of the Somaris/5 DICOM query/retrieve SCP application are operating as background daemon processes. They are existing, when the machine is powered on and respond to queries based on the records stored in its database.

Sequencing of Real-World Activities

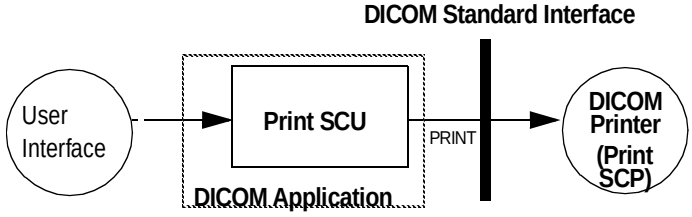
Not applicable.

Print

The Print Management Service Classes define an application-level class of services which facilitate the printing of images on a hardcopy medium. The print management SCU and print management SCP are peer DICOM print management application entities. The DICOM print application supports the print management DIMSE services to act as SCU.

Application Data Flow Diagram

The Somaris/5 DICOM network implementation is a Windows NT application and acts as SCU for the print management network service.



Functional Definitions of Application Entities

The user invokes a print job and the SCU uses the SOP classes of a film session, a film box and image boxes for acquiring all the information which is required for a film session. The N-ACTION is used to print the film session. The DIMSE services of the Printer SOP Class and the Print Job SOP Class allow the SCU to control the print jobs and printer status informations of the SCP.

Sequencing of Real-World Activities

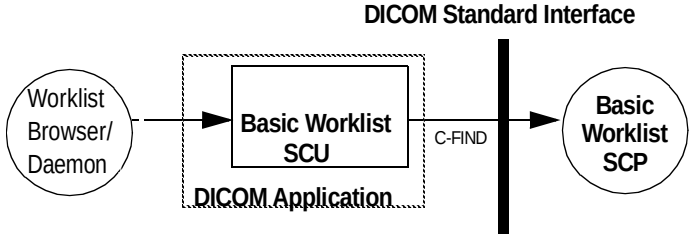
Not applicable.

Basic Worklist

The basic worklist service class defines an application-level class of service which facilitates the transfer of worklists from the information system to the imaging modality. The worklist is queried by the AE and supplies the SCU with the scheduled tasks which have to be performed on the modality. The DICOM worklist application supports the worklist service to act as SCU.

Application Data Flow Diagram

The Somaris/5 DICOM network implementation is a Windows NT application and acts as SCU for the worklist network service.



Note: It is configurable to get the worklist updates either automatically (in a configurable time interval) or manually (initiated by the user).

Functional Definitions of Application Entities

The basic worklist SCU requests the worklist SCP to perform a match to the keys specified in the C-FIND DIMSE service.

The worklist SCP responses to the C-FIND query and sends scheduled imaging service requests and patient demographic information from the information system to the modality.

Sequencing of Real-World Activities

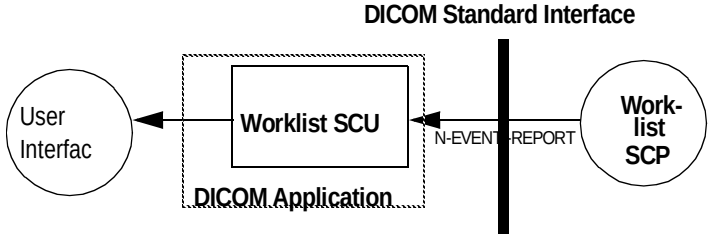
Not applicable.

Worklist

The Study Management service class defines an application-level class of service which facilitates the receiving of study scheduled notifications. A worklist is sent by the information system and supplies the SCU with the scheduled tasks which have to be performed on the modality. The DICOM worklist application supports the worklist service to act as SCU.

Application Data Flow Diagram

The Somaris/5 DICOM network implementation is a Windows NT application and acts as SCU for the worklist network service.



Functional Definitions of Application Entities

The worklist SCP sends the study which is scheduled for an examination at the modality via the N-EVENT-REPORT DIMSE service.

The worklist SCU responds to the N-EVENT-REPORT request and gets all Patient, Study and Visit information for the specified study from the information system.

Sequencing of Real-World Activities

Not applicable.

CHAPTER A.2

Application Entity Specifications

Verification AE Specification

Association Initiation by Real-World Activity

The Somaris/5 DICOM Service Tool application attempts to initiate a new association for

- ❑ DIMSE C-ECHO

service operations.

Real-World Activity - Verification SCU

Associated Real-World Activity - Verification SCU

The associated Real-World activity is a C-ECHO request initiated by the DICOM Service Tool application. If the process successfully establishes an association to a remote Application Entity, it will send the C-ECHO-Request via the open association to verify that the remote Application Entity is responding to DICOM messages.

Proposed Presentation Contexts - Verification SCU

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

SOP Specific Conformance Statement - Verification SCU

The Application conforms to the definition of a Verification SCU in accordance to the DICOM Standard.

Association Acceptance Policy

The Verification SCP is part of the Storage SCP – see → page A.2–11, *Association Acceptance Policy*.

Storage AE Specification

Somaris/5 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Classes as both an SCU and SCP:

SOP Class Name	SOP Class UID
CR Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
SC (Secondary Capture) Image Storage	1.2.840.10008.5.1.4.1.1.7
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
XA (X-Ray Angiographic) Image Storage	1.2.840.10008.5.1.4.1.1.12.1
XA Bi-Plane (X-Ray Angiographic Bi-Plane) Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3
XRF (X-Ray Radiofluoroscopic) Image Storage	1.2.840.10008.5.1.4.1.1.12.2

SOP Class Name	SOP Class UID
NM Image Storage	1.2.840.10008.5.1.4.1.1.20
PET Image Storage	1.2.840.10008.5.1.4.1.1.128
Verification (only SCP)	1.2.840.10008.1.1

Somaris/5 DICOM implementation provide Private Conformance to the following DICOM V3.0 conform Private SOP Classes as both an SCU and SCP:

SOP Class Name	SOP Class UID
CSA Non-Image Storage	1.3.12.2.1107.5.9.1

Association Establishment Policies

General

The configuration of the Somaris/5 DICOM application defines the Application Entity Titles, the port numbers and of course the host name and net address.

Number of Associations

The Somaris/5 DICOM application initiates several associations at a time, one for each transfer request being processed.

Asynchronous Nature

The Somaris/5 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/5 DICOM implementation provides a single Implementation Class UID of

- "1.3.12.2.1107.5.1.3"

and an Implementation Version Name of

- "SIEMENS_S5VA20A".

Association Initiation by Real-World Activity

The Somaris/5 DICOM application attempts to initiate a new association for

- ❑ DIMSE C-STORE

service operations.

Real-World Activity - Storage SCU

Associated Real-World Activity - Storage SCU

The associated Real-World activity is a C-STORE request initiated by an internal daemon process. If the process successfully establishes an association to a remote Application Entity, it will transfer each image one after another via the open association. If the C-STORE Response from the remote Application contains an error status the association is aborted.

Proposed Presentation Contexts - Storage SCU

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
CR Image Storage Service class	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline	1.2.840.10008.1.2.4.50		
		JPEG Extended (2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless	1.2.840.10008.1.2.4.70		
		Non-Hierarchical			
CT Image Storage Service class	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline	1.2.840.10008.1.2.4.50		
		JPEG Extended (2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless	1.2.840.10008.1.2.4.70		
		Non-Hierarchical			

MR Image Storage Service class	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
NM Image Storage Service class	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
SC Image Storage Service class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
XA Image Storage Service class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
XA Bi-Plane Image Storage Service class (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None

XRF Image Storage Service class	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
US MF Image Storage Service class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
US Image Storage Service class	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
PET Image Storage Service class	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCU	None
Waveform Storage Service classes	1.2.840.10008.5.1.4.1.1.9.1.1; 1.2.840.10008.5.1.4.1.1.9.1.2; 1.2.840.10008.5.1.4.1.1.9.1.3; 1.2.840.10008.5.1.4.1.1.9.2.1; 1.2.840.10008.5.1.4.1.1.9.3.1; 1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None
CSA Non-Image Storage Service class	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

Note

JPEG compression transfer syntaxes are supported only for Monochrome images (Photometric Interpretation = “MONOCHROME1” or “MONOCHROME2”)

SOP Specific Conformance Statement - Storage SCU

The DICOM images created by Somaris/5 DICOM application conform to the DICOM IOD definitions (Standard Extended IODs). But they will contain additional private elements which have to be discarded by a DICOM system when modifying the image.

The DICOM nodes are responsible for data consistency when modifying images. All unknown private attributes have to be removed upon modification!

Somaris/5 does not change private attributes if no modification is done. But during a *Save as new* operation nearly all private attributes will be removed.

Image Pixel Attribute Description for Grayscale Images

The Somaris/5 DICOM application supports the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format and graphic overlay with unsigned integer and 8 or 16 bits allocated. Possible values:

Pixel plane

- ❏ samples per pixel (attribute 0028, 0002) = 1
- ❏ photometric interpretation (attribute 0028,0004) = “MONOCHROME1”
- ❏ photometric interpretation (attribute 0028,0004) = “MONOCHROME2”
- ❏ pixel representation (attribute 0028, 0103) = 0
- ❏ bits allocated (attribute 0028, 0100) = 8, 16
- ❏ bits stored (attribute 0028,0101) = 8, 10, 12
- ❏ high bit (attribute 0028,0102) = 7, 9, 11

Overlay plane
- ❏ overlay type (attribute 60xx, 0040) = “G”
- ❏ overlay bits allocated (attribute 60xx, 0100) = 16
- ❏ overlay bit position (attribute 60xx, 0102) = 12, 13, 14, 15

Overlay plane
- ❏ overlay type (attribute 60xx, 0040) = “G”
- ❏ overlay bits allocated (attribute 60xx, 0100) = 1
- ❏ overlay bit position (attribute 60xx, 0102) = 0
- ❏ overlay data (attribute 60xx, 3000) = supported.

The Somaris/5 DICOM application sends also the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format with binary 2’s complement integer and 16 bits allocated. Possible values:

Pixel plane
- ❏ samples per pixel (attribute 0028, 0002) = 1
- ❏ photometric interpretation (attribute 0028,0004) = “MONOCHROME1”
- ❏ photometric interpretation (attribute 0028,0004) = “MONOCHROME2”
- ❏ pixel representation (attribute 0028, 0103) = 1
- ❏ bits allocated (attribute 0028, 0100) = 16
- ❏ bits stored (attribute 0028,0101) = 16
- ❏ high bit (attribute 0028,0102) = 15

Overlay plane
- ❏ overlay type (attribute 60xx, 0040) = “G”
- ❏ overlay bits allocated (attribute 60xx, 0100) = 1
- ❏ overlay bit position (attribute 60xx, 0102) = 0
- ❏ overlay data (attribute 60xx, 3000) = supported.

Image Pixel Attribute Description for Color Images

The Somaris/5 DICOM application supports the RGB color image description with the unsigned integer 24 bit color image plane pixel format:

- ❏ samples per pixel (attribute 0028, 0002) = 3
- ❏ photometric interpretation (attribute 0028,0004) = “RGB”
- ❏ pixel representation (attribute 0028, 0103) = 0
- ❏ bits allocated (attribute 0028, 0100) = 8
- ❏ bits stored (attribute 0028,0101) = 8
- ❏ high bit (attribute 0028,0102) = 7
- ❏ planar configuration (attribute 0028,0006) = 0.

The Somaris/5 DICOM application supports the “Palette Color” color image description with unsigned integer and 2’s complement pixel format:

- ❏ samples per pixel (attribute 0028, 0002) = 1
- ❏ photometric interpretation (attribute 0028,0004) = “PALETTE COLOR”
- ❏ pixel representation (attribute 0028, 0103) = 0
- ❏ bits allocated (attribute 0028, 0100) = 8, 16
- ❏ bits stored (attribute 0028,0101) = 8, 16
- ❏ high bit (attribute 0028,0102) = 7, 15

Both 8bit and 16bit palettes are supported - but no Segmented Palette Color LUTs.

Association Acceptance Policy

The Somaris/5 DICOM application attempts to accept a new association for

- ❏ DIMSE C-ECHO
- ❏ DIMSE C-STORE

service operations.

> **Note**
>
> While physically writing to CD-R, Association Requests will be rejected to avoid problems on storing data caused by network activities.

Real-World Activity - Storage SCP

Associated Real-World Activity - Storage SCP

The daemon receiving process will accept an association and will receive any images transmitted on that association and will store the images on disk in the own database.

Proposed Presentation Contexts - Storage SCP

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
CR Image Storage Service class	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Baseline	1.2.840.10008.1.2.4.50		
		JPEG Extended (2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2.4.70		

CT Image Storage Service class	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
MR Image Storage Service class	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
NM Image Storage Service class	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
SC Image Storage Service class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
XA Image Storage Service class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None

XA Bi-Plane Image Storage Service class (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
XRF Image Storage Service class	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
US MF Image Storage Service class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
US Image Storage Service class	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None
PET Image Storage Service class	1.2.840.10008.5.1.4.1.1.128	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian JPEG Baseline JPEG Extended (2 & 4) JPEG Lossless Non-Hierarchical	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70	SCP	None

Waveform Storage Service classes	1.2.840.10008.5.1.4.1.1.9.1.1; 1.2.840.10008.5.1.4.1.1.9.1.2; 1.2.840.10008.5.1.4.1.1.9.1.3; 1.2.840.10008.5.1.4.1.1.9.2.1; 1.2.840.10008.5.1.4.1.1.9.3.1; 1.2.840.10008.5.1.4.1.1.9.4.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
CSA Non-Image Storage Service class	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

Note

JPEG compression transfer syntaxes are supported only for Monochrome images (Photometric Interpretation = "MONOCHROME1" or "MONOCHROME2")

SOP Specific Conformance Statement - Storage SCP

The Somaris/5 DICOM application conforms to the Full Storage Service Class at Level 2 - with the exception that private Sequences (private elements with VR=SQ) are not supported in Explicit VR Transfer syntax and will be ignored. When private Sequences are received in implicit VR then the whole sequence is stored as one binary element of VR=OW.

In the event of a successful C-STORE operation, the image has successfully been written on disk in the Siemens CSA image format.

The DICOM receiver returns the status Success upon successful operation otherwise one of the following status codes is returned and the association aborted:

- Refused (A700):
  This error status indicates a lack of Resources (e.g. not enough disk space) on the Somaris/5 modality.
- Error (A900 or C000):
  An error occurred while processing the image which makes it impossible to proceed. The image will not be stored and the association aborted.

If an image with the same SOP Instance UID (as that image being received) is already present in the database then the received image will be ignored. So if a remote node sends twice the same image (same SOP Instance UID) then there will still be only one image (the first) in the database of the DICOM receiver.

The Somaris/5 DICOM receiver can receive all kinds of different image formats. But for Display of such images the following restrictions apply:

Image Pixel Attribute Acceptance Criterion for Grayscale Images

The Display application accepts the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format and graphic overlay with unsigned integer and 8 or 16 bits allocated. Accepted values:

Pixel plane
- ❏ samples per pixel (attribute 0028, 0002) = 1
- ❏ photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
- ❏ photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
- ❏ pixel representation (attribute 0028, 0103) = 0 (unsigned)
- ❏ bits allocated (attribute 0028, 0100) = 8, 16
- ❏ bits stored (attribute 0028,0101) = 8, 10, 12
- ❏ high bit (attribute 0028,0102) = 7, 9, 11

Overlay plane
- ❏ overlay type (attribute 60xx, 0040) = “G”
- ❏ overlay bits allocated (attribute 60xx, 0100) = 16
- ❏ overlay bit position (attribute 60xx, 0102) = 12, 13, 14, 15

Overlay plane
- ❏ overlay type (attribute 60xx, 0040) = “G”
- ❏ overlay bits allocated (attribute 60xx, 0100) = 1
- ❏ overlay bit position (attribute 60xx, 0102) = 0
- ❏ overlay data (attribute 60xx, 3000) = supported.

The Somaris/5 DICOM application accepts also the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format with binary 2’s complement integer and 16 bits allocated. Accepted values:

Pixel plane
- ❏ samples per pixel (attribute 0028, 0002) = 1
- ❏ photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
- ❏ photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
- ❏ pixel representation (attribute 0028, 0103) = 1 (signed)
- ❏ bits allocated (attribute 0028, 0100) = 16
- ❏ bits stored (attribute 0028,0101) = 16
- ❏ high bit (attribute 0028,0102) = 15

Overlay plane
- ❏ overlay type (attribute 60xx, 0040) = “G”
- ❏ overlay bits allocated (attribute 60xx, 0100) = 1
- ❏ overlay bit position (attribute 60xx, 0102) = 0
- ❏ overlay data (attribute 60xx, 3000) = supported.

For MOD LUT both the linear LUT (Rescale Slope/Intercept) and the MOD LUT SQ are supported and considered when pixel data is displayed. However there are two limitations. The MOD LUT SQ will be ignored in the following cases:

- ⇨ signed pixels
- ⇨ the pixel format is changed by the MOD LUT (e.g. 8 bit -> 16 bit)

If the MOD LUT SQ contains multiple LUTs then only the first one is used.

For VOI LUT also both the linear LUT (Window Center/Width) and the VOI LUT SQ are supported (VOI LUT SQ with 8 or 16 bit LUT data).
But if both a VOI LUT SQ and a linear MOD LUT are specified within one image then the value for Rescale Slope is restricted to 1.

If the VOI LUT SQ contains multiple LUTs then only the first one is used.

The Display application supports only rectangular Shutters in this version. Images with other shutter types will be displayed without Shutter.

Image Pixel Attribute Acceptance Criterion for Color Images

The Siemens Display application supports the RGB color image description with the unsigned integer 24 bit color image plane pixel format. Accepted values:

- ❏ samples per pixel (attribute 0028, 0002) = 3
- ❏ photometric interpretation (attribute 0028,0004) = “RGB”
- ❏ pixel representation (attribute 0028, 0103) = 0
- ❏ bits allocated (attribute 0028, 0100) = 8
- ❏ bits stored (attribute 0028,0101) = 8
- ❏ high bit (attribute 0028,0102) = 7
- ❏ planar configuration (attribute 0028,0006) = 0 (pixel interleave)

The Somaris/5 DICOM application supports the “Palette Color” color image description with unsigned integer and 2’s complement pixel format:

- ❏ samples per pixel (attribute 0028, 0002) = 1
- ❏ photometric interpretation (attribute 0028,0004) = “PALETTE COLOR”
- ❏ pixel representation (attribute 0028, 0103) = 0
- ❏ bits allocated (attribute 0028, 0100) = 8, 16
- ❏ bits stored (attribute 0028,0101) = 8, 16
- ❏ high bit (attribute 0028,0102) = 7, 15

Both 8bit and 16bit palettes are supported - but no Segmented Palette Color LUTs.

Presentation Context Acceptance Criterion - Storage SCP

The Somaris/5 DICOM application will accept any number of Verification or storage SOP classes that are listed above. There is no limit on the number of presentation contexts accepted except for the DICOM limit. In the event that the Siemens Somaris/5 DICOM application runs out of resources, it will reject the association request.

Transfer Syntax Selection Policies - Storage SCP

The Somaris/5 DICOM application supports

- the Implicit VR Little Endian, the Explicit VR Little Endian and Explicit VR Big Endian transfer syntaxes
- the JPEG Baseline and JPEG Extended transfer syntaxes (JPEG lossy).
- the JPEG lossless Non-Hierarchical transfer syntax.

Any proposed presentation context which includes one of these transfer syntaxes will be accepted. Any proposed presentation context that does not include one of these transfer syntaxes will be rejected.

Query/Retrieve AE Specification

The Query/Retrieve SCU request that the remote SCP perform a match of all keys specified in the request, against the information in its database and the identified images will be moved or retrieved to the same or a different storage association.

The Query/Retrieve SCP responds to queries based on the records based on its database and images will be send to the requesting SCU or to a different storage destination.

Somaris/5 DICOM application provides Standard Conformance to the following DICOM V3.0 SOP Classes as SCU and SCP:

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

Somaris/5 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2

Note

For the DICOM Retrieve SOP class C-MOVE please see → page A.2–11, *Association Acceptance Policy* for more information about supported DICOM IODs and Presentation contexts supported by the Siemens Storage SCP.

Association Establishment Policies

General

The configuration of the Somaris/5 DICOM query/retrieve application defines the Application Entity Titles, the port numbers and of course the host name and net address.

Number of Associations

The Somaris/5 DICOM application initiates several association at a time, one for each query/retrieve request being processed.

Asynchronous Nature

The Somaris/5 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/5 DICOM implementation provides a single Implementation Class UID of

- ❏ “1.3.12.2.1107.5.1.3"

and an Implementation Version Name of

- ❏ “SIEMENS_S5VA20A”.

Association Initiation Policy

The Query/Retrieve SCU and SCP establish an association by using the DICOM association services. During association establishment the Query/Retrieve application entities negotiate the supported SOP classes to exchange the capabilities of the SCU and the SCP.

The following DIMSE-C operations are supported as SCU:

- ❏ C-FIND
- ❏ C-MOVE

Real-World Activity - Find SCU

Associated Real-World Activity - Find SCU

The associated Real-World activity is to initiate query request to an SCP with the query models Patient Root and Study Root.

Proposed Presentation Contexts - Find SCU

The Somaris/5 DICOM Query application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Study Root Query/ Retrieve Find	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

It is configurable which of the two query models (or both) are to be used by the Siemens Query SCU application.

Note

C-FIND Extended Negotiation is NOT supported by the SCU.

SOP Specific Conformance Statement - Find SCU

The Somaris/5 DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. The following tables describe the search keys for the different query models that the Siemens Query application supports as an SCU:

Attribute name	Tag	Type	Matching	user input	return value displayed
Patient level					
Patient name[a]	(0010,0010)	R	wildcard	enter value	yes
Patient ID[b]	(0010,0020)	U (Patient Root) R (Study Root)	wildcard	enter value	yes
Patient's birth date	(0010,0030)	O	universal (NULL)	-	yes
Patient's sex	(0010,0040)	O	universal (NULL)	-	yes
Study level					
Study instance UID	(0020,000D)	U	single value	select from list	-
Study ID	(0020,0010)	R	universal (NULL)	-	-
Study date	(0008,0020)	R	universal (NULL)	-	yes
Study time	(0008,0030)	R	universal (NULL)	-	yes
Accession number	(0008,0050)	R	universal (NULL)	-	yes
Study description	(0008,1030)	O	universal (NULL)	-	yes

Attribute name	Tag	Type	Matching	user input	return value displayed
Series level					
Series instance UID	(0020,000E)	U	single value	select from list	-
Series number	(0020,0011)	R	universal (NULL)	-	yes
Modality	(0008,0060)	R	universal (NULL)	-	yes
Series date	(0008,0021)	O	universal (NULL)	-	yes
Series time	(0008,0031)	O	universal (NULL)	-	yes
Series description	(0008,103E)	O	universal (NULL)	-	yes
Image Level					
SOP Instance UID	(0008,0018)	U	single value	-	-
Image Number	(0020,0013)	R	universal (NULL)	-	yes

a. : In the Patient Name always a "*" is added
b. : In the Patient ID always a "*" is added

The Find SCU interprets following status codes:

C-FIND response status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

Real-World Activity - Move SCU

Associated Real-World Activity - Move SCU

The operator uses the Somaris/5 DICOM Query application to enter the query values and then initiates the retrieval of all matching DICOM composite objects (like images) from the remote node.

This will generate retrieval requests to a remote C-MOVE SCP using the C-MOVE operation with the query model Patient Root and Study Root. The Storage Service Class Conformance Statement of the SCP must describe the C-STORE service which is generated by the C-MOVE service.

Proposed Presentation Contexts - Move SCU

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.1.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Study Root Query/ Retrieve Move	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

Note

C-MOVE Extended Negotiation will be NOT supported by the SCU.

SOP Specific Conformance Statement - Move SCU

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations must be done on a different association to transfer images to another SCP of the Storage Service Class.

The Move SCU interprets following status codes:

C-MOVE response status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform suboperations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
Failed	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures of Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Association Acceptance Policy

The Query/Retrieve SCU and SCP establish an association by using the DICOM association services. During association establishment the Query/Retrieve application entities negotiate the supported SOP classes to exchange the capabilities of the SCU and the SCP.

The following DIMSE-C operations are supported as SCP:

- ❏ C-FIND
- ❏ C-MOVE
- ❏ C-FIND-CANCEL

The SCP does support multiple C-FIND-requests over the same association, but not multiple C-MOVE requests.

> **Note**
>
> While physically writing to CD-R, Association Requests will be rejected to avoid problems on storing data caused by network activities.

Real-World Activity - Find SCP

Associated Real-World Activity - Find SCP

The associated Real-World activity is to respond to query requests to an SCU with the query model Patient Root, Study Root and Patient/Study Only.

Proposed Presentation Contexts - Find SCP

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Study Root Query/ Retrieve Find	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Patient/Study Only Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.3.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

> **Note**
>
> C-FIND Extended Negotiation will be NOT supported by the SCP.

SOP Specific Conformance Statement - Find SCP

The Somaris/5 DICOM Query/Retrieve SCP supports hierarchical queries with all mandatory and optional search keys. The following four tables describe the search keys for the four levels of query that the SCP supports.

Patient level attributes

Attribute name	Tag	Type	Matching
Patient name	(0010,0010)	R	single value, wildcard, universal
Patient id	(0010,0020)	U (Patient Root, Patient/Study only) R (Study Root)	single value, wildcard, universal
Patient's birth date	(0010,0030)	O	single value, range, universal
Patient's birth time	(0010,0032)	O	single value, range, universal
Patient's sex	(0010,0040)	O	single value, wildcard, universal
Ethnic group	(0010,2160)	O	single value, wildcard, universal
Patient comments	(0010,4000)	O	universal

Study level attributes			
Attribute name	**Tag**	**Usage SCU**	**Matching**
Study instance UID	(0020,000D)	U	single value, list of UID
Study id	(0020,0010)	R	single value, wildcard, universal
Study date	(0008,0020)	R	single value, range, universal
Study time	(0008,0030)	R	single value, range, universal
Accession number	(0008,0050)	R	single value, wildcard, universal
Referring physician's name	(0008,0090)	O	single value, wildcard, universal
Study description	(0008,1030)	O	single value, wildcard, universal
Admitting diagnoses description	(0008,1080)	O	single value, wildcard, universal
Patient's age	(0010,1010)	O	single value, wildcard, universal
Patient's size	(0010,1020)	O	single value, universal
Patient's weight	(0010,1030)	O	single value, universal
Occupation	(0010,2180)	O	single value, wildcard, universal
Additional patient history	(0010,21B0)	O	universal
Interpretation author	(4008,010C)	O	single value, wildcard, universal

Series level attributes			
Attribute name	**Tag**	**Usage SCU**	**Matching**
Series instance UID	(0020,000E)	U	single value, list of UID
Series number	(0020,0011)	R	single value, wildcard, universal
Modality	(0008,0060)	R	single value, wildcard, universal
Laterality	(0020,0060)	O	single value, wildcard, universal
Referenced study component sequence	(0008,1111)	O	universal
Body part examined	(0018,0015)	O	single value, wildcard, universal
Patient position	(0018,5100)	O	single value, wildcard, universal
Smallest pixel value in series	(0028,0108)	O	single value, universal
Largest pixel value in series	(0028,0109)	O	single value, universal
Protocol name	(0018,1030)	O	single value, wildcard, universal
Series date	(0008,0021)	O	single value, range, universal
Series time	(0008,0031)	O	single value, range, universal
Series description	(0008,103E)	O	single value, wildcard, universal

Image level attributes			
Attribute name	**Tag**	**Usage SCU**	**Matching**
SOP instance UID	(0008,0018)	U	single value, list of UID
Image number	(0020,0013)	R	single value, universal
Image date	(0008,0023)	O	single value, range, universal
Image time	(0008,0033)	O	single value, range, universal

The query attributes will be treated Case Sensitive.

In DICOM wildcard queries the symbol '?' is treated as '*' by Find SCP.
So a wildcard query with "?abc*" is actually treated as "*abc*"

The C_FIND_RSP message will contain the following attributes:

- ❏ Specific Character Set (0008,0005)
- ❏ Query/Retrieve Level (0008,0052) from the C_FIND_RQ
- ❏ Retrieve AE Title (0008,0054):
  this value is NULL except for the lowest level of the query model (Image level for Patient Root or Study Root and Study level for Patient/Study Only)
- ❏ Storage-Media File-set ID (0088,0130) at level study, series and image. If Storage-Media File-set ID is not present a NULL value will be returned.
- ❏ attributes requested by C_FIND_RQ

A remote DICOM AE can cancel the query by sending a C_CANCEL_FIND_RQ message. If the Find SCP receives C_CANCEL_FIND_RQ before it has completed the processing of the matches it stops the database matching process and returns a status of Cancelled to the remote DICOM AE.

The Find SCP returns following status codes:

C-FIND return status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

Real-World Activity - Move SCP

Associated Real-World Activity - Move SCP

The associated Real-World activity is to respond to retrieve requests to an SCU. The SCP supports the query model Patient Root, Study Root and Patient/Study Only. The Storage Service Class Conformance Statement describes the C-STORE service which is generated by the C-MOVE service.

Proposed Presentation Contexts - Move SCP

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Patient Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.1.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Study Root Query/ Retrieve Move	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		
Patient/Study Only Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.3.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCP	See Note
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

Note

C-MOVE Extended Negotiation will be NOT supported by the SCP.

SOP Specific Conformance Statement - Move SCP

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations is done on a different association, specified in the C-MOVE request, to transfer images to another SCP of the Storage Service Class.

Note

In DICOM wildcard queries the symbol '?' is treated as '*' by Find SCP.
So a wildcard query with "?abc*" is actually treated as "*abc*"

The Move SCP returns following status codes:

C-MOVE return status

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform suboperations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
Failed	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures of Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

Print AE Specification

The print management SCU invokes print management DIMSE services to transfer images from the local AE to the remote SCP AE to print the images with the defined film format and size on a selected network DICOM hardcopy printer. See DICOM part 4 annex H.

Somaris/5 DICOM implementation provides Standard Conformance to the following DICOM V3.0 Basic Grayscale Print Management Meta SOP Class, and the optional Print Job SOP Class as an SCU:

SOP Class Name	SOP Class UID	Usage SCU/SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	M/M
– Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	M/M
– Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	M/M
– Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	M/M
Printer SOP Class	1.2.840.10008.5.1.1.16	M/M
Print Job SOP Class	1.2.840.10008.5.1.1.14	U/U

Association Establishment Policies

General

The configuration of the Somaris/5 DICOM print management SCU defines the Application Entity Titles, the port numbers and of course the host name and net address.

Number of Associations

The Somaris/5 DICOM application initiates one/several association(s) at a time, one for each transfer request being processed.

Asynchronous Nature

The Somaris/5 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/5 DICOM implementation provides a single Implementation Class UID of

- "1.3.12.2.1107.5.1.3"

and an Implementation Version Name of

- "SIEMENS_S5VA20A".

Association Initiation Policy

The Print Management SCU and SCP establish an association by using the DICOM association services. During association establishment the Print Management application entities negotiate the supported SOP classes to exchange the capabilities of the SCU and the SCP. If the SCU supports only mandatory SOP classes, the negotiation of optional capabilities is not necessary.

Real-World Activity

Associated Real-World Activity

The associated Real-World activity is to print over a network a set of images on a film sheet with one or more copies. The images are converted to Standard\1-1. If the response from the remote application contains a status other than Success or Warning the association is aborted.

Proposed Presentation Contexts

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Basic Grayscale Print Management Meta SOP class	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax,	1.2.840.10008.1.2.2		

The Basic Grayscale Print Management Meta SOP class contains the following Presentation Contexts					
Basic film session SOP class	1.2.840.10008.5.1.1.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax,	1.2.840.10008.1.2.2		
Basic film box SOP class	1.2.840.10008.5.1.1.2	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax,	1.2.840.10008.1.2.2		
Basic grayscale image box SOP class	1.2.840.10008.5.1.1.4	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax,	1.2.840.10008.1.2.2		
Printer SOP class	1.2.840.10008.5.1.1.16	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax,	1.2.840.10008.1.2.2		

		Presentation Context Table			
Print Job SOP class	1.2.840.10008.5.1.1.14	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax,	1.2.840.10008.1.2.2		

SOP Specific Conformance Statement

The Somaris/5 DICOM SCU conforms to the DICOM Basic Grayscale Print Management Meta SOP Class.

The application uses a setting platform to define the properties of the connected DICOM SCP, e.g.:

- ❏ maximum number of print jobs in the queue
- ❏ maximum number of print copies
- ❏ supported film sizes of the connected DICOM SCP
- ❏ supported film formats of the DICOM SCP
- ❏ lookup table definition.

The printing is only suspended in the case of a failure return status of the SCP.

SOP Specific Conformance to Basic Film Session SOP Class

The Basic Film Session information object definition describes all the user defined parameter which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes and that are printed on one hardcopy printer.

The Somaris/5 DICOM Print application supports the following DIMSE Service Elements for the Basic Film Session SOP class as SCU:

- ❏ N-CREATE
- ❏ N-DELETE

The Basic Film Session SOP class N_CREATE_RQ (SCU) uses following attributes:

Attribute name	Tag	Usage SCU	Supported Values
Number of Copies	(2000,0010)	U	
Medium Type	(2000,0030)	U	BLUE FILM CLEAR FILM PAPER
Film Destination	(2000,0040)	U	MAGAZINE PROCESSOR

The Affected SOP Instance UID received in N_CREATE_RSP message from SCP will be saved internally and used for later requests like N_DELETE_RQ on the Basic Film Session SOP Class - see table below:

Attribute name	Tag	Source of information
Requested SOP Instance UID	(0008,0018)	Affected SOP Instance UID of N_CREATE_RSP on Basic Film Session

The N_DELETE_RQ on the Basic Film Session SOP Class is used to delete the complete Basic Film Session SOP Instance hierarchy.

The Basic Film Session SOP class interprets following status codes (from N_CREATE_RSP, N_DELETE_RSP messages):

Service Status	Meaning	Protocol Codes
Failure	Film session SOP instances hierarchy does not contain film box SOP instances	C600
	Unable to create print job, print queue is full	C601
	Image size is larger than images box size	C603
Warning	Memory allocation not supported	B600
	Film session printing is not supported	B601
Warning	Film box does not contain image box (empty page)	B602
Success	Film belonging to the film session are accepted for printing	0000

SOP Specific Conformance to Basic Film Box SOP Class

The Basic Film Box information object definition describes all the user defined parameter of one film of the film session. The Basic Film Box information description defines the presentation parameters which are common for all images on a given sheet of film.

The Basic Film Box refers to one or more Image Boxes.

Supported as SCU are:

- ❏ N-CREATE
- ❏ N-ACTION
- ❏ N-DELETE

The Basic Film Box SOP class N_CREATE_RQ message uses following attributes (the used values for each attribute depend how the DICOM Printer is configured within the Siemens product):

Attribute name	Tag	Usage SCU	Supported Values
Image Display Format	(2010,0010)	M	STANDARD\1-1
Referenced Film Session Sequence	(2010,0500)	M	
>Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	(0008,1155)	M	
Film Orientation	(2010,0040)	M	PORTRAIT
Film Size ID	(2010,0050)	M	8INX10IN 10INX14IN 11INX14IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM
Magnification Type	(2010,0060)	M	BILINEAR CUBIC NONE REPLICATE

The N_CREATE_RSP message from the SCP then contains the References Image Box Sequence with its SOP Class and Instance UIDs which is stored internally and then used for the Basic Image Box SOP Class N-SET RQ messages.

After all parameters for the Image boxes on the filmsheet have been set then the Somaris/5 DICOM print application SCU will issue a N_ACTION_RQ message with the SOP Instance UID of the Basic Film Box (returned in N_CREATE_RSP of Basic Film Box SOP class) and the Action Type ID set to 1.

The Affected SOP Instance UID received in N_CREATE_RSP message from SCP will be saved internally and can be used later for N_DELETE_RQ request on the Basic Film Box SOP Class - see table below:

Attribute name	Tag	Source of information
Requested SOP Instance UID	(0008,0018)	Affected SOP Instance UID of N_CREATE_RSP on Basic Film Box

The Basic Film Box SOP class interprets following status codes from the N_CREATE_RSP, N_DELETE_RSP and N_ACTION_RSP messages:

Service Status	Meaning	Protocol Codes
Failure	Unable to create print job; print queue is full	C602
	Image size is larger than image box size	C603
Warning	Film box does not contain image box (empty page)	B603
	Requested MinDensity or MaxDensity outside of printer's operating range	B605
Success	Film accepted for printing	0000

SOP Specific Conformance to Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data which apply to a single image of a sheet of film.

The Grayscale Image Box SOP class uses only the N_SET_RQ with the following attributes

Attribute name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
Basic Grayscale Image Sequence	(2020,0110)	M	
>Samples Per Pixel	(0028,0002)	M	1
>Photometric Interpretation	(0028,0004)	M	MONOCHROME2 for Grayscale Images
>Rows	(0028,0010)	M	
>Columns	(0028,0011)	M	
>Pixel Aspect Ratio	(0028,0034)	M	
>Bits Allocated	(0028,0100)	M	8
>Bits Stored	(0028,0101)	M	8
>High Bit	(0028,0102)	M	7
>Pixel Representation	(0028,0103)	M	0
>Pixel Data	(7FE0,0010)	M	

The Grayscale Image Box SOP class interprets following status codes:

Service Status	Meaning	Protocol Codes
Warning	Requested MinDensity or MaxDensity outside of printer's operating range	B605
Failure	Image contains more pixel than printer can print in Image box	C603
	Insufficient memory in printer to store the image	C605
Success		0000

SOP Specific Conformance to Printer SOP Class

The Printer SOP Class is the possibility to monitor the status of the hardcopy printer in a synchronous and an asynchronous way.

The Somaris/5 DICOM Print application uses the mandatory N-EVENT Report DIMSE service to monitor the changes of the printer status in an asynchronous way

It can directly ask the Print SCP for its status or can receive Events from the Print SCP asynchronously:

- ❏ N_GET as SCU
- ❏ N_EVENT_REPORT as SCU

In this case the following information is supported:

Event type name	Event	Attributes	Tag	Usage SCU
Normal	1			
Warning	2	Printer Status Info	(2110,0020)	U
Failure	3	Printer Status Info	(2110,0020)	U

Attribute name	Tag	Usage SCP	supported values
Printer Status	(2110,0010)	M	NORMAL FAILURE WARNING
Printer Status Info	(2110,0020)	M	[a] SUPPLY LOW RECEIVER FULL NO RECEIVE MGZ FILM JAM

a. Only valid in case of Printer Status WARNING

SOP Specific Conformance to Print Job SOP Class

The Print Job SOP Class is the possibility to monitor the execution of the print process.

The Somaris/5 DICOM Print application supports the optional N-EVENT report DIMSE service to receive the changes of the print job status in an asynchronous way.

It can receive events from the Print SCP asynchronously:

❏ N-EVENT-REPORT

The following information is supported:

Event type name	Event	Attributes	Tag	Usage SCU
Normal	1	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

Event type name	Event	Attributes	Tag	Usage SCU
Printing	2	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Done	3	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Failure	4	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

Basic Worklist AE Specification

The basic worklist SCU requests that the remote SCP performs a match of all keys specified in the query against the information in its worklist database.

SIEMENS Somaris/5 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU:

SOP Class Name	SOP Class UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

Association Establishment Policies

General

The configuration of the Somaris/5 DICOM Basic Worklist SCU application defines the Application Entity Titles, the port numbers and of course the host name and net address.

Number of Associations

The Somaris/5 DICOM application initiates one/several association(s) at a time, one for each transfer request being processed.

Asynchronous Nature

The Somaris/5 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/5 DICOM implementation provides a single Implementation Class UID of

❏ “1.3.12.2.1107.5.1.3"

and an Implementation Version Name of

❏ “SIEMENS_S5VA20A”.

Association Initiation Policy

The modality worklist SCU establish an association by using the DICOM association services. During association establishment the negotiation of SOP classes to exchange the capabilities of the SCU and the SCP is not supported.

The following DIMSE-C operation is supported as SCU:

❏ C-FIND

Real-World Activity

Associated Real-World Activity

The associated Real-World activity is to initiate query requests to an SCP by using the DICOM Worklist Information Model.

Proposed Presentation Contexts

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

SOP Specific Conformance Statement

Search Key Attributes of the Worklist C-FIND

The Somaris/5 DICOM worklist SCU supports worklist queries with all required search keys. The following tables describe the search keys that the SCU supports.

Attribute name	Tag	Matching Key Type	query value
Scheduled Procedure Step Sequence	(0040,0100)	R	
>Scheduled Station AE Title	(0040,0001)	R	configurable: own AET or empty
>Scheduled Procedure Step Start Date	(0040,0002)	R	today-today
>Scheduled Procedure Step Start Time	(0040,0003)	R	0000-235959
>Modality	(0008,0060)	R	own
>Scheduled Performing Physician's Name	(0040,0006)	R	NULL

Attribute name	Tag	Matching Key Type	query value
Patient's Name	(0010,0010)	R	NULL
Patient ID	(0010,0020)	R	NULL

Return Key Attributes used from the Worklist C_FIND_RSP

The Somaris/5 DICOM worklist SCU supports worklist queries with return key attributes of all types. The following tables describe the return keys that the SCU support

Attribute name	Tag	Return Key Type	displayed in User Interface
SOP Common			
Specific Character Set	(0008,0005)	1C	
Scheduled Procedure Step			
Scheduled Procedure Step Sequence	(0040,0100)	1	-
>Scheduled Station AE Title	(0040,0001)	1	yes
>Scheduled Procedure Step Start Date	(0040,0002)	1	yes
>Scheduled Procedure Step Start Time	(0040,0003)	1	yes
>Scheduled Procedure Step End Date	(0040,0004)	3	-
>Scheduled Procedure Step End Time	(0040,0005)	3	-
>Modality	(0008,0060)	1	-
>Scheduled Performing Physician's Name	(0040,0006)	1	-
>Scheduled Procedure Step Description	(0040,0007)	1C	yes
>Scheduled Station Name	(0040,0010)	2	-
>Scheduled Procedure Step Location	(0040,0011)	2	-
>Scheduled Action Item Code Sequence	(0040,0008)	1C	-
>>Code Value	(0008,0100)	1C	-
>>Coding Scheme Designator	(0008,0102)	1C	-
>>Code Meaning	(0008,0104)	3	-

Attribute name	Tag	Return Key Type	displayed in User Interface
>Pre-Medication	(0040,0012)	2C	-
>Scheduled Procedure Step ID	(0040,0009)	1	-
>Requested Contrast Agent	(0032,1070)	2C	-
>Comments on the Scheduled Procedure Step	(0040,0400)	3	-
Requested Procedure			
Requested Procedure ID	(0040,1001)	1	yes
Requested Procedure Description	(0032,1060)	1C	-
Requested Procedure Code Sequence	(0032,1064)	1C	-
>Code Value	(0008,0100)	1C	-
>Code Scheme Designator	(0008,0102)	1C	-
>Code Meaning	(0008,0104)	3	-
Study Instance UID	(0020,000D)	1	-
Referenced Study Sequence	(0008,1110)	2	-
>Referenced SOP Class UID	(0008,1150)	1C	-
>Referenced SOP Instance UID	(0008,1155)	1C	-
Requested Procedure Priority	(0040,1003)	2	-
Patient Transport Arrangements	(0040,1004)	2	-
Reason for the Requested Procedure	(0040,1002)	3	-
Placer Order Number / Procedure	(0040,1006)	3	-
Filler Order Number / Procedure	(0040,1007)	3	-
Confidentiality Code	(0040,1008)	3	-
Reporting Priority	(0040,1009)	3	-

Attribute name	Tag	Return Key Type	displayed in User Interface
Names of Intended Recipients of results	(0040,1010)	3	-
Requested Procedure Comments	(0040,1400)	3	-
Requested Procedure Location	(0040,1005)	3	-
Imaging Service Request			
Accession Number	(0008,0050)	2	-
Requesting Physician	(0032,1032)	2	-
Referring Physician's Name	(0008,0090)	2	-
Reason for the Imaging Service Request	(0040,2001)	3	-
Imaging Service Request Comments	(0040,2400)	3	-
Requesting Service	(0032,1033)	3	-
Issuing Date of Imaging Service Request	(0040,2004)	3	-
Issuing Time of Imaging Service Request	(0040,2005)	3	-
Placer Order Number / Imaging Service Request	(0040,2006)	3	-
Filler Order Number / Imaging Service Request	(0040,2007)	3	-
Order entered by...	(0040,2008)	3	-
Order Enterer's Location	(0040,2009)	3	-
Order Callback Phone Number	(0040,2010)	3	-
Visit Identification			
Admission ID	(0038,0010)	2	-

Attribute name	Tag	Return Key Type	displayed in User Interface
Visit Status			
Current Patient Location	(0038,0300)	2	-
Patient's Institution Residence	(0038,0400)	3	-
Visit Relationship			
Referenced Patient Sequence	(0008,1120)	2	-
>Referenced SOP Class UID	(0008,1150)	2	-
>Referenced SOP Instance UID	(0008,1155)	2	-
Patient Identification			
Patient's Name	(0010,0010)	1	yes
Patient ID	(0010,0020)	1	yes
Patient Demographic			
Patients Birth Date	(0010,0030)	2	yes
Patient's Sex	(0010,0040)	2	yes
Patient's Weight	(0010,1030)	2	-
Confidential constraint on patient data	(0040,3001)	2	-
Patient Medical			
Patient State	(0038,0500)	2	-[a]
Pregnancy Status	(0010,21C0)	2	yes
Medical Alerts	(0010,2000)	2	yes
Contrast Allergies	(0010,2110)	2	yes
Special Needs	(0038,0050)	2	-[a]

a. not displayed yet in current Version

Status Codes of the Worklist C-FIND

The worklist SCU interprets following status codes:

Service Status	Meaning	Status Codes (0000,0900)
Refused	Out of Resources	A700
Failed	Identifier does not match SOP Class	A900
	Unable to process	Cxxx
Cancel	Matching terminated due to Cancel request	FE00
Success	Matching is complete - No final Identifier is supplied	0000
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01

Worklist AE Specification

The worklist SCU is receiving the worklist information (study scheduled information) of a patient to be examined at the modality from the remote SCP.

Somaris/5 DICOM implementation provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU:

SOP Class Name	SOP Class UID
Study Management	1.2.840.10008.3.1.2.3.1

Association Establishment Policies

General

The configuration of the Somaris/5 DICOM study management application defines the Application Entity Titles, the port numbers and of course the host name and net address.

Number of Associations

The Somaris/5 DICOM application initiates one/several association(s) at a time, one for each transfer request being processed.

Asynchronous Nature

The Somaris/5 DICOM implementation does not support asynchronous communication (multiple outstanding transactions over a single association).

Implementation Identifying Information

The Somaris/5 DICOM implementation provides a single Implementation Class UID of

❏ “1.3.12.2.1107.5.1.3"

and an Implementation Version Name of

❏ “SIEMENS_S5VA20A”.

Association Initiation Policy

The worklist SCU establish an association by using the DICOM association services. During association establishment the negotiation of SOP classes to exchange the capabilities of the SCU and the SCP is not supported.

The following DIMSE-N operation is supported as SCU:

❏ N-EVENT-REPORT

Real-World Activity

Associated Real-World Activity

The associated Real-World activity is to send a study scheduled event to an SCU by using the DICOM Study Management Information Model.

Proposed Presentation Contexts

The Somaris/5 DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended
Name	**UID**	**Name List**	**UID List**		**Negotiation**
Detached Study Management	1.2.840.10008.3.1.2.3.1	DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2		

SOP Specific Conformance to Study Management SOP Class

Attributes Send in the study scheduled N-EVENT-REPORT request

The Somaris/5 DICOM worklist SCU supports the following attributes:

Event Type Name	Event Type ID	Attribute Name	Tag
STUDY SCHEDULED	2	Specific Character Set	(0008,0005)
		Referenced Patient Sequence	(0008,1120)
		>Referenced SOP Class UID	(0008, 1150)
		>Referenced SOP Instance UID	(0008, 1155)
		Referenced Visit Sequence	(0008,1125)
		>Referenced SOP Class UID	(0008, 1150)
		>Referenced SOP Instance UID	(0008, 1155)
		Scheduled Study Start Date	(0032,1000)
		Scheduled Study Start Time	(0032,1001)
		Scheduled Study Location	(0032,1020)
		Scheduled Study Location Application Entity Title	(0032,1021)
		Requested Procedure Description	(0032,1060)
		Requested Procedure Code Sequence	(0032,1064)
		>Code Value	(0008,0100)
		>Coding Scheme Designator	(0008,0102)
		>Code Meaning	(0008,0104)

CHAPTER
A.3 Communication Profiles

Supported Communication Stacks

The Somaris/5 DICOM application provide DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

OSI Stack

not supported.

TCP/IP Stack

The Somaris/5 DICOM application uses the TCP/IP stack from the Windows NT system upon which it executes. It uses the MergeCOM-3 subroutine library from Merge Technologies Inc. that is based on a Berkeley socket interface.

API

The Somaris/5 DICOM application uses the MergeCOM library that is based on a TCP/IP socket interface.

Physical Media Support

The Somaris/5 DICOM application is indifferent to the physical medium over which TCP/IP executes; it inherits this from the Windows NT system upon which it executes.

Point-to-Point Stack

not supported.

CHAPTER A.4

Extensions/Specializations/ Privatizations

Standard Extensions

Standard Extensions of all SOP Classes

The following tables list the data dictionary of all DICOM IOD attributes where the DICOM standard definitions are extended:

Attribute Name	Tag	Private Creator	Type	Notes
Image Type	(0008,0008)	-	1	see → page A.4–3, Image Type additional Defined Terms: Defined Terms for value 3: OTHER MPR PROJECTION IMAGE UNDEFINED Defined Terms for value 4: CSA *[a] CT_SOM4 *[b] CT_SOM5 SHS * SOMATOM Volume Class provides a value 5 with the Defined Terms: ADD CTL OTOM OTOP PTOM PTOP see → page A.4–3, Image Type for further explanation

Attribute Name	Tag	Private Creator	Type	Notes
Patient Position	(0018,5100)	-	2C	Additional Defined Terms for the Magnetom Open: HLS HLP FLS FLP HLDL HLDR FLDL FLDR see → page A.4–8, Patient Position for further explanation
Body Part Examined	(0018,0015)		3	additional Defined Terms for the SOMATOM Volume Class: SPINE SPECIAL UNKNOWN SERVICE see → page A.4–8, Body Part Examined for further explanation

a. For terms beginning with the stated prefix, e. g. "CSA", and ending with a "*" see → page A.4–3, Image Type.
b. For private extensions see → page A.4–8, Body Part Examined

All SOP classes may contain additional type 3 attributes which DICOM standard defines in a different DICOM IOD or DICOM SOP class (attributes from Normalized SOP classes).

This is the case for example for

- Rescale Slope (0028,1053)
- Rescale Intercept (0028,1052)

which are also used in the MR IOD.

Image Type

The Image Type (0008,0008) attribute identifies important image identification characteristics. These characteristics are:

1. Pixel Data Characteristics:
❏ is the image an ORIGINAL Image; an image whose pixel values are based on original or source data, or
❏ is the image a DERIVED Image; an image whose pixel values have been derived in some manner from the pixel value of one or more other images.

2. Patient Examination Characteristics:
❏ is the image a PRIMARY Image; an image created as a direct result of the Patient examination, or
❏ is the image a SECONDARY Image; an image created after the initial Patient examination.

3. Modality Specific Characteristics (SOP Specific Characteristics).

4. Implementation specific identifiers; other implementation specific identifiers shall be documented in an implementation's conformance claim.

The Image Type attribute is multi-valued and shall be provided in the following manner:
❏ Value 1 shall identify the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:
  ❏ ORIGINAL = identifies an Original Image
  ❏ DERIVED = identifies a Derived Image
❏ Value 2 shall identify the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  ❏ PRIMARY = identifies a Primary Image
  ❏ SECONDARY = identifies a Secondary Image
❏ Value 3 shall identify any Image IOD specific specialization, the following terms are defined in addition to the DICOM standard definitions:
  ❏ OTHER = converted non-Axial and non-Localizer CT images; images of no special type (new syntax)

- MPR = 3D MPR images
- PROJECTION IMAGE = 3D MIP and SSD images
- UNDEFINED = images of no special type (old syntax)

- **Value 4** is implementation specific. The following terms are defined:
  - Syngo generated image types:
    CSA AVERAGE = image was created by Average
    CSA BLACK IMAGE = SC Image with black pixels, only graphics information is of interest
    CSA RESAMPLED = derived image created by zooming or panning original image
    CSA MIP = image created by Maximum Intensity Projection
    CSA MIP THIN = image created by Maximum Intensity Projection
    CSA MPR = image created by Multi Planar Reconstruction
    CSA MPR CURVED = image created by Multi Planar Reconstruction
    CSA MPR THICK = image created by Multi Planar Reconstruction
    CSA MPR THIN = image created by Multi Planar Reconstruction
    CSA SSD = SC Image as Shaded Surface Display
    CSA SUBTRACT = image was created by Subtraction
  - SOMATOM Volume Class generated image types:
    CT_SOM5 ICD = Interventional Cine Display Image
    CT_SOM5 MON = Monitoring Image
    CT_SOM5 MUL = Multiscan Image
    CT_SOM5 ROT = ROT Image
    CT_SOM5 RTD = Real Time Display Image
    CT_SOM5 SEQ = Sequence Image
    CT_SOM5 SPI = Spiral Image
    CT_SOM5 STA = Static Image
    CT_SOM5 TOP = Topogram
    CT_SOM5 DPAN = Dental Panorama Rebuilt Tomogram
    CT_SOM5 DPAR = Dental Paraxial Rebuilt Tomogram
    CT_SOM5 PEVI = Pulmo Evaluation Image

CT_SOM5 OEVA = Osteo Evaluated Tomogram
CT_SOM5 MIP = Maximum Intensity Projection image created by a CT application
CT_SOM5 MPR = Multi Planar Reconstruction image created by a CT application

❑ converted images

CT_SOM4 NONE = converted SOMARIS image
CT_SOM4 CONV = converted SOMARIS Convolution Kernel file
CT_SOM4 DART = converted SOMARIS Dental Artificial image
CT_SOM4 DEVA = converted SOMARIS Dental Evaluation image
CT_SOM4 DGRA = converted SOMARIS Dental Graphics image
CT_SOM4 DMEA = converted SOMARIS Dynamic Measurement image
CT_SOM4 DPAN = converted SOMARIS Dental Panorama image
CT_SOM4 DPAR = converted SOMARIS Dental Paraxial image
CT_SOM4 EBT = converted SOMARIS Evolution image
CT_SOM4 HIS = converted SOMARIS Histogram Graphics image
CT_SOM4 HISC = converted SOMARIS Histogram Graphics image
CT_SOM4 MUL = converted SOMARIS Multiscan image
CT_SOM4 OEVA = converted SOMARIS Osteo Evaluation image
CT_SOM4 OTOM = converted SOMARIS Osteo Tomogram image
CT_SOM4 OTOP = converted SOMARIS Osteo Topogram image
CT_SOM4 PLOT = converted SOMARIS Plot image
CT_SOM4 QUAL = converted SOMARIS Quality image
CT_SOM4 R2D = converted SOMARIS 2D Rebuild image
CT_SOM4 R3D = converted SOMARIS 3D Rebuild image
CT_SOM4 R3DE = converted SOMARIS 3D Rebuild image

CT_SOM4 RMAX = converted SOMARIS Maximum Intensity Projection image
CT_SOM4 RMIN = converted SOMARIS Minimum Intensity Projection image
CT_SOM4 ROT = converted SOMARIS Rotation Mode image
CT_SOM4 RRAD = converted SOMARIS Radiographic Projection image
CT_SOM4 RVIT = converted SOMARIS Vessel Image Tool image
CT_SOM4 RVRT = converted SOMARIS Volumetric Rendering image
CT_SOM4 SAVE = converted SOMARIS Evolution Screen Save image
CT_SOM4 SCAN = converted SOMARIS Standard Mode image
CT_SOM4 SEQ = converted SOMARIS Sequence Mode image
CT_SOM4 SER = converted SOMARIS Serial Mode image
CT_SOM4 SIN = converted SOMARIS Sinogram image
CT_SOM4 SINC = converted SOMARIS Sinogram image
CT_SOM4 SPI = converted SOMARIS Spiral Mode image
CT_SOM4 STA = converted SOMARIS Static Mode image
CT_SOM4 TAB = converted SOMARIS Correction Table image
CT_SOM4 TOP = converted SOMARIS Topogram image
CT_SOM4 GTOP = converted SOMARIS Topo Graphics image
CT_SOM4 PEVG = converted SOMARIS Pulmo Evaluation image
CT_SOM4 PEVI = converted SOMARIS Pulmo Evaluation image
CT_SOM4 PUL = converted SOMARIS Pulmo Respiration curve
CT_SOM4 PROT = converted SOMARIS Protocol image
CT_SOM4 TEXT = converted SOMARIS Text image
CT_SOM4 ICD = converted SOMARIS Interventional Cine image

SHS DENT = converted MagicView Dental Tomogram image
SHS DPAN = converted MagicView Dental Panorama image
SHS DPAR = converted MagicView Dental Paraxial image
SHS 3D_CURVED = converted MagicView image
SHS 3D_MIP = converted MagicView Maximum Intensity Projection image
SHS 3D_MPR = converted MagicView Multi Planar Reconstruction image
SHS 3D_SSD = converted MagicView Shaded Surface Display image
SHS 3D_VRT = converted MagicView Volumetric Rendering image

- **Value 5** is specific for the SOMATOM Volume Class implementation. The following terms are defined:
  ADD = Additional Scan
  CTL = Control Scan
  OTOM = Osteo Scanned Tomogram
  OTOP = Osteo Scanned Topogram
  PTOM = Pulmo Scanned Tomogram
  PTOP = Pulmo Scanned Topogram

Patient Position

The Patient Position attribute (0018,5100) defines the patient position relative to the equipment.

The Defined Terms for this value were extended for the MAGNETOM OPEN product. Here the patient is not positioned HeadFirst/FeetFirst when facing the front of the imaging equipment but HeadLeft or FeetLeft.

The new values are:
- ❏ **HLS** (Head left - Supine)
- ❏ **HLP** (Head left - Prone)
- ❏ **FLS** (Feet left - Supine)
- ❏ **FLP** (Feet left - Prone)
- ❏ **HLDL** (Head left - Decubitus left)
- ❏ **HLDR** (Head left - Decubitus right)
- ❏ **FLDL** (Feet left - Decubitus left)
- ❏ **FLDR** (Feet left - Decubitus right)

Body Part Examined

The Body Part Examined (0018,0015) attribute provides a textual description of the part of the body examined. The SOMATOM Volume Class extends the Defined Terms:

- ❏ **SPINE** = Summary term used instead of the Defined Terms CSPINE, TSPINE, LSPINE, and SSPINE
- ❏ **SPECIAL** = Image was acquired with acquisition modes that are not mapped to a certain part of the body
- ❏ **SERVICE** = Image was acquired for maintenance purpose
- ❏ **UNKNOWN** = No information about the body part available

See → page A.4–11, *Somaris/5 Attribute Interpretation* for a mapping of the body region selected for examination to the Body Part Examined terms.

Specializations

Specifications

The following table lists the Somaris/5 image types and the corresponding combinations of the Image Type Attribute values:

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/5 Image Text
Interventional Cine Display Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 ICD	none	ICD
Monitoring Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 MON	none	MON
Multiscan Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 MUL	none	MUL
ROT Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 ROT	none	ROT
Real Time Display Image	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 RTD	none	RTD
Sequence Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ	none	SEQ
Additional Scan Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ	ADD	SEQ
Control Scan Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SEQ	CTL	SEQ
Spiral Image	CT	ORIGINAL	PRIMARY / SECONDARY	AXIAL	CT_SOM5 SPI	none	SPI
Static Image	CT	ORIGINAL	PRIMARY	OTHER	CT_SOM5 STA	none	STA
Topogram	CT	ORIGINAL	PRIMARY	LOCALIZER	CT_SOM5 TOP	none	TOP

Image Type Description	IOD	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/5 Image Text
Osteo Scanned Tomogram	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 SEQ	OTOM	SEQ
Osteo Scanned Topogram	CT	ORIGINAL	PRIMARY	LOCALIZER	CT_SOM5 TOP	OTOP	TOP
Osteo Evaluated Tomogram	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 OEVA	none	OEVA
Pulmo Scanned Tomogram	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 SEQ	PTOM	SEQ
Pulmo Scanned Tomogram	CT	ORIGINAL	PRIMARY	AXIAL	CT_SOM5 SPI	PTOM	SPI
Pulmo Scanned Topogram	CT	ORIGINAL	PRIMARY	LOCALIZER	CT_SOM5 TOP	PTOP	TOP
Pulmo Evaluated Tomogram	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 PEVI	none	PEVI
Dental Panorama Rebuild Tomogram	SC	DERIVED	SECONDARY	OTHER	CT_SOM5 DPAN	none	DPAN
Dental Paraxial Rebuild Tomogram	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 DPAR	none	DPAR
Dental Panorama Reference Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MPR	none	MPR
Dental Paraxial Reference Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MPR	none	MPR
Dental Reference Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MPR	none	MPR
Dental Maximum Intensity Projection Image	CT	DERIVED	SECONDARY	AXIAL	CT_SOM5 MIP	none	MIP
Various Graphics	SC	DERIVED	SECONDARY	OTHER	CSA BLACK IMAGE	none	none

Somaris/5 Attribute Interpretation

The following table lists how some attributes are set by Somaris/5:

Tag	Name	Explanation
0008,0012	Instance Creation Date	The current real-world date and time when a particular image is created.
0008,0013	Instance Creation Time	
0008,0020	Study Date	For existing studies their date and time entries are copied into the corresponding entries in a new image's header. If a new study is created the date and time entries from the first series of this new study will be used.
0008,0030	Study Time	
0008,0021	Series Date	For existing series their date and time entries are copied into the corresponding entries in a new image's header. If a new series is created the current real-world date and time will be used.
0008,0031	Series Time	
0008,0022	Acquisition Date	Acquisition Date and Time is defined as the real-world beginning of the accumulation of data which contribute to a particular image. Due to the multi-slice technology several images may have the same Acqusition Date and Time.
0008,0032	Acquisition Time	
0008,0023	Image Date	For all images which result from a reconstruction of acquired data, the time stamp is the same as Acquisition Date and Time. This is true as well as for images that were reconstructed immediately after data acquisition as well as for images that were reconstructed at any time later. For all other images created by any other means the time stamp is derived from a point in time during the creation process of these images.
0008,0033	Image Time	

Tag	Name	Explanation
0008,1030	Study Description	Is derived from information entered during patient registration or examination setup.
0008,103E	Series Description	Is derived from the parameters of the data acquisition and reconstruction process.
0018,1152	Exposure	For spiral images the product of exposure time and x-ray tube current is corrected with Table Feed per Rotation. Expressed in mAs.
0018,1190	Focal Spots	Size of the focal spot actually used to generate x-ray radiation for a particular image.This is a single value expressed in mm.
0020,1041	Slice Location	Topogram: Slice Location is defined as the relative position of the very beginning of the Topogram image expressed in mm. Tomogram: Slice Location is defined as the relative position of the center of an image's slice expressed in mm. These positions are relative to the current reference point and corresponds to the table position.
0018,0015	Body Part Examined	The Body Part Examined is derived from the body region selected for examination during patient registration or examination setup. **Body Region** — **Body Part Examined** Head — HEAD Neck — NECK Shoulder — SHOULDER Thorax — BREAST Abdomen — ABDOMEN Spine — SSPINE Pelvis — PELVIS Extremities — EXTREMITY Specials — SPECIALS n. a. — SERVICE n. a. — UNKNOWN

Tag	Name	Explanation
0018,0010	Contrast/Bolus Agent	For images created during an acquisition: The attribute is filled with the value entered during examination setup. For images created by a subsequent reconstruction after acquisition: The attribute is filled with the fixed term "APPLIED" if contrast/bolus agent information was entered during examination setup.
0020,0032	Image Position (Patient)	The x, y, and z coordinates of the upper left hand corner (upper left hand corner of the first pixel transmitted) of the image, in mm.

Privatisations

Private Elements for Storage SOP Classes

The following private attributes are defined for all Siemens Syngo based applicarions.

Registry of DICOM Data Elements

Tag	Private Owner Code	Name	VR	VM	Notes
(0029,xx08)	SIEMENS CSA HEADER	CSA Image Header Type	CS	1	
(0029,xx09)	SIEMENS CSA HEADER	CSA Image Header Version	LO	1	
(0029,xx10)	SIEMENS CSA HEADER	CSA Image Header Info	OB	1	
(0029,xx18)	SIEMENS CSA HEADER	CSA Series Header Type	CS	1	
(0029,xx19)	SIEMENS CSA HEADER	CSA Series Header Version	LO	1	
(0029,xx20)	SIEMENS CSA HEADER	CSA Series Header Info	OB	1	
(0029,xx08)	SIEMENS CSA NON-IMAGE	CSA Data Type	CS	1	
(0029,xx09)	SIEMENS CSA NON-IMAGE	CSA Data Version	LO	1	
(0029,xx10)	SIEMENS CSA NON-IMAGE	CSA Data Info	OB	1	
(0029,xx08)	SIEMENS MEDCOM HEADER	MedCom Header Type	CS	1	
(0029,xx09)	SIEMENS MEDCOM HEADER	MedCom Header Version	LO	1	
(0029,xx10)	SIEMENS MEDCOM HEADER	MedCom Header Info	OB	1	
(0029,xx20)	SIEMENS MEDCOM HEADER	MedCom History Information	OB	1	

Tag	Private Owner Code	Name	VR	VM	Notes
(0029,xx31)	SIEMENS MEDCOM HEADER	PMTF Information 1	LO	1	
(0029,xx32)	SIEMENS MEDCOM HEADER	PMTF Information 2	UL	1	
(0029,xx33)	SIEMENS MEDCOM HEADER	PMTF Information 3	UL	1	
(0029,xx34)	SIEMENS MEDCOM HEADER	PMTF Information 4	CS	1	
(0029,xx08)	SIEMENS MEDCOM OOG	MEDCOM OOG Type	CS	1	
(0029,xx09)	SIEMENS MEDCOM OOG	MEDCOM OOG Version	LO	1	
(0029,xx10)	SIEMENS MEDCOM OOG	MEDCOM OOG Info	OB	1	

Tag	Private Owner Code	Name	VR	VM
(7FE1,xx10)	SIEMENS CSA NON-IMAGE	CSA Data	OB	1

The next subsections will explain in which IODs these private data elements are used.

All Syngo Supported Image SOP Classes

Extended Image IOD Module Table

IE	Module	Reference	Usage	Note
Patient	Patient	part 3 C.7.1.1	M	
Study	General Study	part 3 C.7.2.1	M	
	Patient Study	part 3 C.7.2.2	U	
Series	General Series	part 3 C.7.3.1	M	
Equipment	General Equipment	part 3 C.7.5.1	U	
Image	General Image	part 3 C.7.6.1	M	
	Image Pixel	part 3 C.7.6.3	M	
	IOD specific modules	part 3 C.8.2.1	M/U	depends on the IOD
	CSA Image Header	→ page A.4–17, CSA Image Header Module	U	
	CSA Series Header	→ page A.4–17, CSA Series Header Module	U	
	MEDCOM Header	→ page A.4–18, MEDCOM Header Module	U	private History information
	MEDCOM OOG	→ page A.4–19, MEDCOM OOG Module	U	if object graphics is attached to image
	SOP Common	part 3 C.12.1	M	

CSA Image Header Module

The table in this section contains private IOD Attributes that describe the CSA Image Header.

Attribute Name	Tag	Private Creator	Type	Notes
CSA Image Header Type	(0029,xx08)	SIEMENS CSA HEADER	1	CSA Image Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4 SOM 5 = Somaris/5
CSA Image Header Version	(0029,xx09)	SIEMENS CSA HEADER	3	Version of CSA Image Header Info (0029,xx10) format.
CSA Image Header Info	(0029,xx10)	SIEMENS CSA HEADER	3	product dependent information.

CSA Series Header Module

The table in this section contains private IOD Attributes that describe the CSA Series Header.

Attribute Name	Tag	Private Creator	Type	Notes
CSA Series Header Type	(0029,xx18)	SIEMENS CSA HEADER	1	CSA Series Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4 SOM 5 = Somaris/5
CSA Series Header Version	(0029,xx19)	SIEMENS CSA HEADER	3	Version of CSA Series Header Info (0029,xx20) format.
CSA Series Header Info	(0029,xx20)	SIEMENS CSA HEADER	3	product dependent information.

MEDCOM Header Module The table in this section contains private IOD Attributes that describe MEDCOM Header.

Attribute Name	Tag	Private Creator	Type	Notes
MedCom Header Type	(0029,xx08)	SIEMENS MEDCOM HEADER	1C	MedCom Header identification characteristics. Defined Terms: MEDCOM 1 Required if MedCom Header Info (0029,xx10) present.
MedCom Header Version	(0029,xx09)	SIEMENS MEDCOM HEADER	2C	Version of MedCom Header Info (0029,xx10) format. Required if MEDCOM Header Info (0029,xx10) present.
MedCom Header Info	(0029,xx10)	SIEMENS MEDCOM HEADER	3	Manufacturer model dependent information. The value of the attribute MedCom Header Info (0029,xx10) can be build up in each user defined format.
MedCom History Information	(0029,xx20)	SIEMENS MEDCOM HEADER	3	MedCom defined Patient Registration history information. See → page A.4–19, MEDCOM History Information.
PMTF Information 1	(0029,xx31)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 2	(0029,xx32)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 3	(0029,xx33)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 4	(0029,xx34)	SIEMENS MEDCOM HEADER	3	Transformation Information

MEDCOM History Information

The value of the attribute MEDCOM History Information (0029,xx20) is defined in the following way:

Part	Name	Type	Bytes	Notes
header	Identifier	string	32	always "CSA HISTORY"
	Version	string	32	e.g. "V1.10"
n items	Class Name	string	64	
	Modification String	string	1024	

MEDCOM OOG Module

The table in this section contains private IOD Attributes that describe MEDCOM Object Oriented Graphics (OOG). This module is used when object graphics is drawn on the image and stores the properties of the graphics objects (Line, Circle, Rectangle, Arrow, and so on). So the graphics objects will remain reanimatable even if such an image is transferred via DICOM C-STORE SOP class.

Attribute Name	Tag	Private Creator	Type	Notes
MedCom OOG Type	(0029,xx08)	SIEMENS MEDCOM OOG	1	MEDCOM Object Oriented Graphics (OOG) identification characteristics. Defined Terms: MEDCOM OOG 1
MedCom OOG Version	(0029,xx09)	SIEMENS MEDCOM OOG	3	Version of MEDCOM OOG Info (0029,xx10) format.
MedCom OOG Info	(0029,xx10)	SIEMENS MEDCOM OOG	3	MEDCOM Object Oriented Graphics (OOG) data.

The graphics objects are also stored in one Image overlay plane for compatibility with other products which don't support the MedCom OOG module. Any system which does not support this MedCom OOG module has to remove these private attributes when modifying the image overlay data.

Private Elements for CT Image Storage SOP Classes

The following private attributes are defined by Somaris/5.

Registry of DICOM Data Elements

Tag	Private Owner Code	Name	VR	VM	Notes
(0019,xx90)	SIEMENS CT VA0 COAD	Osteo Offset	DS	1	Offset of the water equivalent material of the Siemens Osteo phantom to real water
(0019,xx92)	SIEMENS CT VA0 COAD	Osteo Regression Line Slope	DS	1	Slope of the regression line for the ESP (=European Spine Phantom) standardization
(0019,xx93)	SIEMENS CT VA0 COAD	Osteo Regression Line Intercept	DS	1	Intercept of the regression line for the ESP (= European Spine Phantom) standardization
(0019,xx96)	SIEMENS CT VA0 COAD	Osteo Phantom Number	IS	1	Number of the Siemens Osteo phantom
(0019,xxB0)	SIEMENS CT VA0 COAD	Feed per Rotation	DS	1	Som/4 style Feed per Rotation (Backwards Compatibility)
(0019,xxBD)	SIEMENS CT VA0 COAD	Pulmo Trigger Level	IS	1	Spirometer trigger level used for the scan, given in percent of VC (= Vital Capacity) of the patient

Tag	Private Owner Code	Name	VR	VM	Notes
(0019,xxBE)	SIEMENS CT VA0 COAD	Expiratoric Reserve Volume	DS	1	ERV (= Exspiratoric Reserve Volume) achieved by the patient
(0019,xxBF)	SIEMENS CT VA0 COAD	Vital Capacity	DS	1	VC (= Vital Capacity) achieved by the patient
(0019,xxC0)	SIEMENS CT VA0 COAD	Pulmo Water	DS	1	Density of the water insert of the Siemens Pulmo phantom
(0019,xxC1)	SIEMENS CT VA0 COAD	Pulmo Air	DS	1	Density of the air holes of the Siemens Pulmo phantom
(0019,xxC2)	SIEMENS CT VA0 COAD	Pulmo Date	DA	1	Date of the evaluation of the Siemens Pulmo phantom
(0019,xxC3)	SIEMENS CT VA0 COAD	Pulmo Time	TM	1	Time of the evaluation of the Siemens Pulmo phantom
(0021xx11)	SIEMENS MED	Target	DS	2	Som/4 style Target (Backwards Compatibility)
(0009,00xx)	SIEMENS CT VA1 DUMMY	Private Creator Data Element	LO	1	1

Private SOP class CSA Non-Image

This chapter includes the definition of the Siemens AG B Med CSA defined private Non-Image Object (called CsaNonImage IOD). The focus of this private Non-Image Object is to address the requirement for non-image data sets found in Syngo based applications.

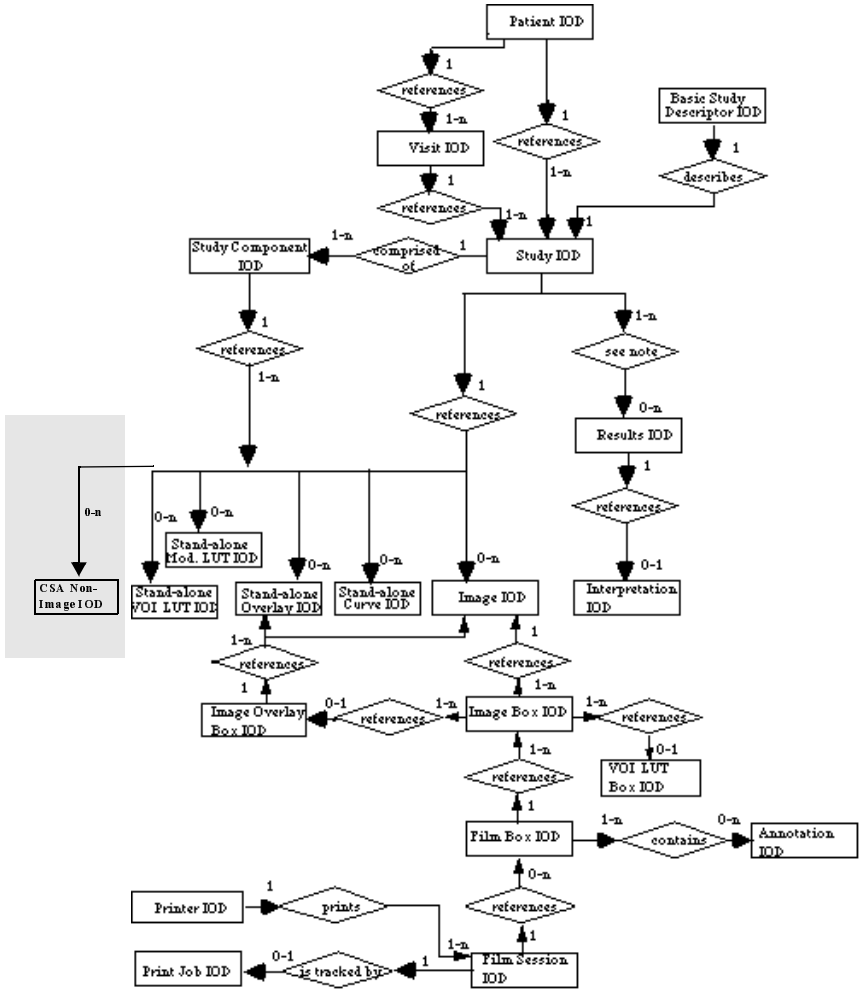
The MedCom Non-Image Information Object Definition specifies data sets that are converted from a non-DICOM format to a modality independent DICOM format.

Examples of such manufacturer model dependent data sets are:

- ❏ Raw Data
- ❏ CT Admin Data
- ❏ MR Spectroscopy Data
- ❏ etc.

CSA Non-Image IOD Entity Relationship Model

The E-R model in [DICOM] A.1.2 depicts those components of the DICOM Information Model which directly refer to the CSA Non-Image IOD. The frame of reference IE, overlay IE, modality look up table IE, VOI lookup table IE and curve IE are not components of the CSA Non-Image IOD.


Patient IOD
1
references
1-n
Visit IOD
1
references
1-n
Study Component IOD
1-n
comprised of
1
Study IOD
1
references
1-n
Basic Study Descriptor IOD
1
describes
1
references
1-n
1
references
1-n
see note
0-n
Results IOD
1
references
0-1
Interpretation IOD
1
references
1-n
0-n
CSA Non-Image IOD
0-n
0-n
Stand-alone Mod. LUT IOD
Stand-alone VOI LUT IOD
0-n
Stand-alone Overlay IOD
0-n
Stand-alone Curve IOD
0-n
Image IOD
1-n
references
1
Image Overlay Box IOD
0-1
references
1-n
1
references
1-n
Image Box IOD
1-n
references
0-1
VOI LUT Box IOD
1-n
references
1
Film Box IOD
1-n
contains
0-n
Annotation IOD
0-n
references
1
Printer IOD
1
prints
1-n
Film Session IOD
1
Print Job IOD
0-1
is tracked by

CSA Non-Image IOD Module Table

IE	Module	Reference	Usage
Patient	Patient	part 3 C.7.1.1	M
Study	General Study	part 3 C.7.2.1	M
	Patient Study	part 3 C.7.2.2	U
Series	General Series	part 3 C.7.3.1	M
Equipment	General Equipment	part 3 C.7.5.1	U
CSA	CSA Image Header	→ page A.4–17, CSA Image Header Module	U
	CSA Series Header	→ page A.4–17, CSA Series Header Module	U
	MEDCOM Header	→ page A.4–18, MEDCOM Header Module	U
	MEDCOM OOG	→ page A.4–19, MEDCOM OOG Module	U
	CSA Non-Image	→ page A.4–25, CSA Non-Image Module	M
	SOP Common	part 3 C.12.1	M

CSA Non-Image Module

The table in this section contains private IOD Attributes that describe CSA Non-Images.

Attribute Name	Tag	Private Creator	Type	Notes
Image Type	(0008,0008)	-	3	Image identification characteristics. See → page A.4–27, CT Extensions of the Non-Image Object
Acquisition Date	(0008,0022)	-	3	The date the acquisition of data that resulted in this data set started.
Acquisition Time	(0008,0032)	-	3	The time the acquisition of data that resulted in this data set started.
Derivation Description	(0008,2111)	-	3	A text description of how this data set was derived.
Acquisition Number	(0020,0012)	-	3	A number identifying the gathering of data over a period of time which resulted in this data set.
CSA Data Type	(0029,xx08)	SIEMENS CSA NON-IMAGE	1	CSA Data identification characteristics. Defined Terms: RAW DATA NUM 4 = NUMARIS/4 Raw Data SPEC NUM 4 = NUMARIS/4 Spectroscopy RAW DATA SOM 5 = Somaris/5 Raw Data BSR REPORT = BSR Study Report Data
CSA Data Version	(0029,xx09)	SIEMENS CSA NON-IMAGE	3	Version of CSA Data Info (0029,xx10) format and CSA Non-Image Data (7FE1,xx10) format.
CSA Data Info	(0029,xx10)	SIEMENS CSA NON-IMAGE	3	Information to describe the CSA Data (7FE1,xx10). The value of the attribute CSA Data Info (0029,xx10) can be build up in each user defined format.

Attribute Name	Tag	Private Creator	Type	Notes
CSA Data	(7FE1,xx10)	SIEMENS CSA NON-IMAGE	2	Binary data as byte stream.

CT Extensions of the Non-Image Object

Somaris/5 uses the following defined term for Image Type (0008,0008):

- ❏ Value 1: ORIGINAL
- ❏ Value 2: PRIMARY
- ❏ Value 3: AXIAL, LOCALIZER, OTHER
- ❏ Value4: a CT_SOM5 * enumeration
- ❏ Value5: Somaris/5 specific enumeration

The following table lists the Somaris/5 non-image types and the corresponding combinations of the Image Type Attribute values

Description	0008,0008 Value 1	0008,0008 Value 2	0008,0008 Value 3	0008,0008 Value 4	0008,0008 Value 5	Somaris/5 Image Text
Pulmo Respiration Data	ORIGINAL	PRIMARY	OTHER	CT_SOM5 PULM	none	none
ECG Data	ORIGINAL	PRIMARY	OTHER	CT_SOM5 ECG	none	none
Raw Data	Same entries as for images					

Private SOP Classes

SOP Class Name	SOP Class UID
CSA Non-Image	1.3.12.2.1107.5.9.1

Private Transfer Syntaxes

Not applicable

CHAPTER
A.5 Configuration

AE Title / Presentation Address Mapping

To ensure unique identification the hostname should be used for AE Titles (e. g. HRI_myhost). The string can be up to 16 characters long and must not contain any extended characters, only 7 bit ASCII characters (excluding control characters) are allowed according to DICOM standard.

Local AE Titles and Presentation Addresses

The local AE Titles can be configured using the Service application.

The following AETs can be configured:
- ❏ One common AET for Storage AE and Query/Retrieve AE.
- ❏ One common AET for Basic Worklist AE and Worklist AE.
- ❏ One AET for Print AE.

Local Storage and Query/Retrieve SCP listen on port 104.

Local Worklist SCU listens on port 106.

Remote AE Titles and Presentation Addresses

Remote AE Titles, host names and port numbers can be configured using the Service application. For each AET a list of supported services can also be configured.

Configurable Parameters

Storage and Query/Retrieve

The Service application can be used to set the AETs, port numbers, host names, IP addresses, and capabilities for the remote nodes (SCPs). The user can select transfer syntaxes, compression types, and query models for each SCP separately.

Print

The Service application can be used to configure the SCP.

AET, host name, IP address, and port number can be set.

Basic Worklist and Worklist:

The Service application can be used to set the AETs, port numbers, host names, IP addresses, capabilities, and time-outs for the remote nodes (SCPs).

Additional configurable parameters for Basic Worklist Query are:

- ❏ Query Waiting time - the time to wait for the C-FIND-RSP after sending the C-FIND-RQ (default 20 s)
- ❏ Max. Query Match Number - the maximum number of entries accepted in one worklist (default is 100)
- ❏ Query Interval - the time between two C-FIND-RQs to the Hospital Information System (default is 60 min)

Default Parameters

This configuration tool also uses some default parameters:

- ❏ maximal PDU size set to 28672 Bytes
- ❏ time-out for accepting/rejecting an association request: 240 s
- ❏ time-out for responding to an association open/close request: 240 s
- ❏ time-out for accepting a message over network: 240 s
- ❏ time-out for waiting for data between TCP/IP-packets: 240 s

The Time-outs for waiting for a Response message from the remote node are as following:

- ❏ for Storage SCP/SCU: 600 s
- ❏ for Query/Retrieve SCP/SCU: 600 s
- ❏ for Basic Worklist SCU: configurable, see → page A.5–2, *Basic Worklist and Worklist:.*
- ❏ for Print Management SCU:
  time-out for Response to N-SET-RQ: 240 s
  time-out for Response to other Requests: 60 s

CHAPTER A.6

Support of Extended Character Sets

The Somaris/5 DICOM application supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

PART
B

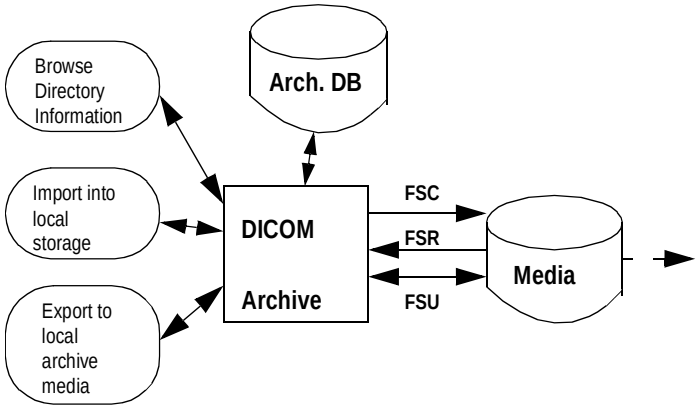
DICOM Conformance Statement

Media Storage

CHAPTER

B.1 Implementation Model

Application Data Flow Diagram



The DICOM archive application will serve as an interface to the CD-R or MOD off-line medium device. It serves interfaces to include the off-line media directory into the browser and to copy SOP instances to a medium or retrieve SOP Instances from medium into local storage.

The DICOM Archive application will support CD-R and MOD media (see Table → page B.2–1.).

The FSU role will update new SOP Instances only to media with pre-existing File-sets conforming to the Application Profiles supported.

The contents of the DICOMDIR will be temporarily stored in Archive-Database.

Functional definitions of AE's

The Somaris/5 DICOM off-line media storage application consists of the DICOM Archive application entity serving all interfaces to access off-line media. The DICOM Archive application is capable of

- ✧ creating a new File-set onto an unwritten medium.
- ✧ updating an existing File-set by writing new SOP Instances onto the medium.
- ✧ copying SOP Instances from the medium onto local storage
- ✧ reading the File-set's DICOMDIR information temporarily into database and pass it to display applications.

Sequencing of Real-World Activities

The DICOM Archive application will not perform updates before the Directory information of the DICOMDIR is completely read.

File Meta Information Options

The Implementation Class UID is:

❏ 1.3.12.2.1107.5.1.3

and an Implementation Version Name of

❏ "SIEMENS_S5VA20A"

CHAPTER B.2

Application Entity Specifications

DICOM Archive Specification

The DICOM Archive provides Standard conformance to Media Storage Service Class (Interchange Option).

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD STD-CTMR-MOD650 STD-CTMR-MOD12 STD-CTMR-MOD23 STD-CTMR-CD STD-XABC-CD STD-XA1K-CD STD-US-ID-SF-FLOP STD-US-ID-SF-MOD128 STD-US-ID-SF-MOD230 STD-US-ID-SF-MOD540 STD-US-ID-SF-MOD650 STD-US-ID-SF-MOD12 STD-US-ID-SF-MOD23 STD-US-ID-SF-CDR STD-WVFM-GEN-FD	Browse Directory Information	FSR	Interchange
	Import into local Storage	FSR	Interchange
	Export to local archive media	FSC,FSU	Interchange

Configuration of uncompressed Transfer Syntax for export will result in compatibility to the STD-GEN-CD profile.

File Meta Information for the Application Entity

The Source Application Entity Title is set by configuration. See → Chapter B.5, *Configuration* for details.

Real-World Activities for this Application Entity

Real-World Activity: Browse Directory Information

The DICOM Archive application acts as FSR using the interchange option when requested to read the media directory.

The DICOM archive application will read the DICOMDIR and insert that directory entries, which are supported, into a local database. The database can the then be used for browsing media contents.

> **Note**
>
> Icon Image SQ is also supported in DICOMDIR. But only those Icon Images with Bits Allocated (0028,0100) equal to 8 and size 64 by 64 or 128 by 128 pixels are imported into database and are visible in PatientBrowser.

Application Profiles for the RWA: Browse Directory Information

See table → page B.2–1 for the Application Profiles listed that invoke this Application Entity for the Browse Directory Information RWA.

Real-World Activity: Import into local Storage

The DICOM Archive application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the local storage.

The SOP Instance selected from the media directory will be copied into the local storage. Only SOP Instances, that are supported, can be retrieved from media storage.

Application Profiles for the RWA: Import into local Storage

See table → page B.2–1 for the Application Profiles listed that invoke this Application Entity for the Copy to Local Storage RWA.

Real-World Activity: Export to local Archive Media

The DICOM Archive application acts as FSU (for media with existing DICOM file-set) or FSC (media not initialized) using the interchange option when requested to copy SOP Instances from the local storage to local Archive medium.

The DICOM Archive application will receive a list of SOP Instances to be copied to the local archive medium. According to the state of the medium inserted (new medium, Medium with DICOM file-set) the SOP Instances are either updated or created on the media. Only valid SOP Instances are accepted.

The DICOM archive application will not close the CD-R medium.

Note

While physically writing to CD-R, Association Requests received by the local Storage SCP or to the local Query SCP will be rejected to avoid problems on storing data caused by network activities.

Application Profiles for the RWA: Export to local Archive Media

See table → page B.2–1 for the Application Profiles listed that invoke this Application Entity for the Copy to local Archive RWA.

Note

If the image to be archived also has an Icon Image in the database then there will be a Icon Image SQ be generated in DICOMDIR file for this image. The Icon Image SQ will contain the following attributes:

- ❏ Samples Per Pixel (0028,0002) = 1
- ❏ Photometric Interpretation (0028,0004) = “MONOCHROME2”
- ❏ Rows (0028,0010), Columns (0028,0011) = 128,128 for XA IOD images = 64,64 for other images
- ❏ Bits Allocated (0028,0100) = 8
- ❏ Bits Stored (0028,0101) = 8
- ❏ High Bit (0028,0102) = 7
- ❏ Pixel Representation (0028,0103) = 0 (unsigned int)
- ❏ Planar Configuration (0028, 0006) is not set
- ❏ Pixel Aspect Ration (0028,0034) is not set (aspect ratio is 1/1)

Application profiles

DICOMDIR keys

The DICOMDIR file will contain the following attributes for the levels Patient - Study - Series - Image/Curve (valid for all Application profiles described in this section):

Attribute Name	Tag	Type	Notes
File-Set identification			
File-set ID	(0004,1130)	2	volume label of media
Directory information			
Offset of the First Directory Record of the Root Directory Entry	(0004,1200)	1	
Offset of the Last Directory Record of the Root Directory Entity	(0004,1202)	1	
File-set Consistency Flag	(0004,1212)	1	0000H
Directory Record Sequence	(0004,1220)	2	
> Offset of the Next Directory Record	(0004,1400)	1C	
> Record In-use flag	(0004,1410)	1C	FFFFH
> Offset of Referenced Lower-Level Directory Entity	(0004,1420)	1C	
> Directory Record Type	(0004,1430)	1C	PATIENT, STUDY, SERIES, IMAGE, CURVE, PRIVATE (see → page B.3–7, *PRI-GEN-CD, PRI-CTMR-xxxx*)
> Referenced File ID	(0004,1500)	1C	contains the filename on media for the Directory Records of Type IMAGE and PRIVATE
> Referenced SOP Class UID in File	(0004,1510)	1C	for the Directory Records of Type IMAGE and PRIVATE

Attribute Name	Tag	Type	Notes
> Referenced SOP Instance UID in File	(0004,1511)	1C	for the Directory Records of Type IMAGE and PRIVATE
> Referenced Transfer Syntax UID in File	(0004,1512)	1C	for the Directory Records of Type IMAGE and PRIVATE
> Record Selection Keys	see below		
Patient Keys			**Directory Record Type PATIENT**
Specific Character Set	(0008,0005)	1C	see → Chapter B.6, *Support of Extended Character Sets*
Patient's Name	(0010,0010)	2	
Patient ID	(0010,0020)	1	
Date Of Birth	(0010,0030)	3	Type 2 in STD-XA-* profiles
Patient's Sex	(0010,0040)	3	Type 2 in STD-XA-* profiles
Study Keys			**Directory Record Type STUDY**
Specific Character Set	(0008,0005)	1C	see → Chapter B.6, *Support of Extended Character Sets*
Study Date	(0008,0020)	1	
Study Time	(0008,0030)	1	
Accession Number	(0008,0050)	2	
Study Description	(0008,1030)	2	
Study Instance UID	(0020,000D)	1C	
Study ID	(0020,0010)	1	Will be generated automatically, if not present. Value = "-"
Series Keys			**Directory Record Type SERIES**
Specific Character Set	(0008,0005)	1C	see → Chapter B.6, *Support of Extended Character Sets*
Series Date	(0008,0021)	3	
Series Time	(0008,0031)	3	

Attribute Name	Tag	Type	Notes
Modality	(0008,0060)	1	
Institution name	(0008,0080)	3	Type 2 in STD-XA* profiles
Institution Address	(0008,0081)	3	Type 2 in STD-XA* profiles
Series Description	(0008,103E)	3	
Performing Physician	(0008,1050)	3	Type 2 in STD-XA* profiles
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	1	
Image Keys			**Directory Record Type IMAGE**
Specific Character Set	(0008,0005)	1C	see → Chapter B.6, *Support of Extended Character Sets*
Image Type	(0008,0008)	3	identification characteristics Type 1 in STD-XA* profiles
SOP Class UID	(0008,0016)	3	
SOP Instance UID	(0008,0018)	3	
Image Date	(0008,0023)	3	
Image Time	(0008,0033)	3	
Referenced Image Sequence	(0008,1140)	3	Type 1C in STD-CTMR profile, required if present in image
> Referenced SOP Class UID	(0008,1150)		
> Referenced SOP Instance UID	(0008,1155)		
Image Number	(0020,0013)	1	
Image Position (Patient)	(00020,0032)	3	Type 1C in STD-CTMR profile, required if present in image
Image Orientation (Patient)	(0020,0037)	3	Type 1C in STD-CTMR profile, required if present in image
Frame Of Reference UID	(0020,0052)	3	Type 1C in STD-CTMR profile, required if present in image

Attribute Name	Tag	Type	Notes
Rows	(0028,0010)	3	
Columns	(0028,0011)	3	
Pixel Spacing	(0028,0030)	3	Type 1C in STD-CTMR profile, required if present in image
Calibration Image	(0050,0004)	3	Type 2 in STD-XA* profiles, for XA IOD
Icon Image Sequence	(0088,0200)	3	required for XA Application profiles, optional for the others
> Samples per Pixel	(0028,0002)		1
> Photometric Interpretation	(0028,0004)		MONOCHROME2
> Rows	(0028,0010)		128 for XA IOD, 64 otherwise Type 1 in STD-CTMR profile
> Columns	(0028,0011)		128 for XA IOD, 64 otherwise Type 1 in STD-CTMR profile
> Bits Allocated	(0028,0100)		8
> Bits Stored	(0028,0101)		8
> High Bit	(0028,0102)		7
> Pixel Representation	(0028,0103)		0 (unsigned)
> Pixel Data	(7FE0,0010)		Icon Image pixel data
Waveform Keys			**Directory Record Type CURVE**
Specific Character Set	(0008,0005)	1C	see → Chapter B.6, *Support of Extended Character Sets*
Curve Number	(0020,0024)	1	

see also → page B.3–7, *PRI-GEN-CD, PRI-CTMR-xxxx* for the DICOMDIR attributes set for CsaNonImage IOD.

STD-GEN-CD

For media conforming to the STD-GEN-CD Profile the following SOP classes will be supported as an FSR, FSC, FSU

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Waveform	1.2.840.10008.5.1.4.1.1.9.0	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Ambulatory ECG Wave-form Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
XA-BiPlane Image	1.2.840.10008.5.1.4.1.1.12.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
XRF-Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Standalone IODs (Standalone Overlay, Standalone Curve, ..) are not supported by either FSR/FSC/FSU.

Detached Patient Management is not supported for import and therefore no precedence of values from those Instances can be supported.

STD-CTMR-xxxx

For media conforming to the STD-CTMR-MOD650, STD-CTMR-MOD12, STD-CTMR-MOD23, STD-CTMR-CD Profiles the following SOP classes will be supported as an FSR, FSC,FSU

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
SC Image (grayscale)	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
SC Image (grayscale)	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
SC Image (palette color)	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
SC Image (palette color)	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes

Detached Patient Management is not supported for import and therefore no precedence of values from those Instances can be supported.

STD-XABC-CD

For media conforming to the STD-XABC-CD Profile the following SOP classes will be supported as an FSR, FSC,FSU

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XA Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes

Detached Patient Management is not supported for import and therefore no precedence of values from those Instances can be supported.

The FSC will create only images with Rows = Columns = 512 on the media.

STD-XA1K-CD

For media conforming to the STD-XABC-CD Profile the following SOP classes will be supported as an FSR, FSC, FSU.

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XA Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Standalone IODs (Standalone Overlay, Standalone Curve, ..) are not supported by either FSR/FSC/FSU.

Detached Patient Management is not supported for import and therefore no precedence of values from those Instances can be supported.

STD-US-ID-SF-xxx

For media conforming to the STD-US-ID-SF-FLOP, STD-US-ID-SF-MOD128, STD-US-ID-SF-MOD230, STD-US-ID-SF-MOD540, STD-US-ID-SF-MOD650, STD-US-ID-SF-MOD12, STD-US-ID-SF-MOD23, STD-US-ID-SF-CDR Profiles the following SOP classes and transfer syntaxes will be supported as an FSR, FSC, FSU.

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Only the following Photometric Interpretations are supported by FSR/FSC/FSU:

- ❏ MONOCHROME2
- ❏ PALETTE COLOR
- ❏ RGB

This restriction also applies for FSR.

STD-WVFM-GEN-FD

For media conforming to the STD-WVFM-GEN-FD Profile the following SOP classes will be supported as an FSR, FSC,FSU

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Ambulatory ECG Wave-form Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Cardiac Elec-trophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Basic Voice Audio Wave-form Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Detached Patient Management is not supported for import and therefore no precedence of values from those Instances can be supported.

CHAPTER B.3

Augmented and Private Profiles

Augmented Application Profiles

When configuring a compressed Transfer Syntax the STD-CTMR and STD-GEN application profile classes will be extended to store instances of the following SOP classes in compressed format:

Augmented Application profiles, Activities, and Roles for DICOM Archive

Application Profiles Supported	Real World Activity	Role	SC Option
AUG-GEN-CD	Browse Directory Information	FSR	Interchange
AUG-CTMR-MOD650 AUG-CTMR-MOD12	Import into local Storage	FSR	Interchange
AUG-CTMR-MOD23 AUG-CTMR-CD	Export to local archive media	FSC, FSU	Interchange

AUG-GEN-CD, AUG-CTMR-xxxx

For media conforming to the AUG-GEN-CD or AUG-CTMR-MOD650, AUG-CTMR-MOD12, AUG-CTMR-MOD23, AUG-CTMR-CD Profile the following SOP classes will be supported as an FSR, FSC, FSU.

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
US-MF image	1.2.840.10008.5.1.4.1.1.3.1	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
US Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
US Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
SC Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
SC Image	1.2.840.10008.5.1.4.1.1.7	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
XA Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
XA Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
XA Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
XA-BiPlane Image	1.2.840.10008.5.1.4.1.1.12.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
XA-BiPlane Image	1.2.840.10008.5.1.4.1.1.12.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
XA-BiPlane Image	1.2.840.10008.5.1.4.1.1.12.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
XA-BiPlane Image	1.2.840.10008.5.1.4.1.1.12.3	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
XRF-Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
XRF-Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
XRF-Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
XRF-Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	no	yes	no
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	yes	yes	yes
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	yes	yes	yes

Note: Compressed color images are not supported.

Private Application Profiles

The following Private Application Profiles supported to store private objects in addition to the Standard SOP classes allowed for the corresponding Standard Application Profile

Private Application profiles, Activities, and Roles for DICOM Archive

Application Profiles Supported	Real World Activity	Role	SC Option
PRI-GEN-CD PRI-CTMR-MOD650 PRI-CTMR-MOD12 PRI-CTMR-MOD23 PRI-CTMR-CD	Browse Directory Information	FSR	Interchange
	Import into local Storage	FSR	Interchange
	Export to local archive media	FSC, FSU	Interchange

PRI-GEN-CD, PRI-CTMR-xxxx

For media conforming to the PRI-GEN-CD or PRI-CTMR-MOD650, PRI-CTMR-MOD12, PRI-CTMR-MOD23, PRI-CTMR-CD Profile the following SOP classes will be supported as an FSR, FSC, FSU in addition to the Standard SOP classes allowed for the corresponding Standard Application Profiles.

Information Object Definitions	SOP Class UID	Transfer Syntax and UID	FSC	FSR	FSU
CsaNonImage	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	yes	yes	yes

The DICOMDIR file will contain the Directory record as described in → page B.2–5, *Application profiles* but with the following Private Keys instead of the Image Keys:

Attribute Name	Tag	Private Creator	Type	Notes
Directory Record Type	(0004,1430)	-	1	PRIVATE
Private Record UID	(0004,1432)	-	1	1.3.12.2.1107.5.9.1
Private keys				
SOP Class UID	(0008,0016)	-	3	1.3.12.2.1107.5.9.1
SOP Instance UID	(0008,0018)	-	3	
Image Type	(0008,0008)	-	3	identification characteristics
Acquisition Date	(0008,0022)	-	3	The date the acquisition of data that resulted in this data set started.
Acquisition Time	(0008,0032)	-	3	The time the acquisition of data that resulted in this data set started.
Acquisition Number	(0020,0012)	-	3	A number identifying the single continuous gathering of data over a period of time which resulted in this data set.
CSA Data Type	(0029,xx08)	SIEMENS CSA NON-IMAGE	1	CSA Data identification characteristics.
CSA Data Version	(0029,xx09)	SIEMENS CSA NON-IMAGE	3	Version of CSA Non-Image Data

No Icon Image SQ will be stored for CsaNonImage objects.

CHAPTER B.4

Extensions, Specializations and Privatizations of SOP Classes and Transfer Syntaxes

Not applicable.

CHAPTER B.5

Configuration

AE Title Mapping

DICOM Media Storage AE Title

The DICOM Storage application (Image Manager) provides the application entity title:

CsaImageManager

CHAPTER B.6

Support of Extended Character Sets

The Somaris/5 DICOM archive application supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

CT

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